

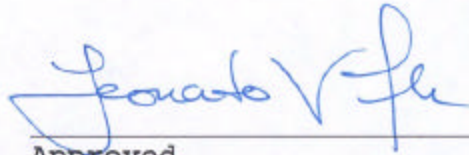
PROJECT MANAGEMENT PLAN

SOUTHEAST OKLAHOMA  
FEASIBILITY STUDY

U.S. Army Corps of Engineers  
Southwestern Division  
Tulsa District

June 2001

The attached Project Management Plan for the Southeast Oklahoma Feasibility Study has been reviewed and is hereby approved [with consensus of the Corporate Board].

A handwritten signature in blue ink, appearing to read "Leonardo V. Flor", written over a horizontal line.

2 Jul 01

Approved  
Colonel Leonardo V. Flor  
District Commander  
Chairman

# ENDORSEMENTS

The Southeast Oklahoma Feasibility Study Project Management Plan has been reviewed and approved as indicated below:

## Sponsor

Oklahoma Water Resources Board

Date

7/10/01

## Board Members

Leonard V. Flor

District Engineer, Chairman

2 Jul 01

John H. Roberts

Deputy for Programs & Project Management

7/02/01

Chris Altendorf

Chief, Civil Works Branch, PPMD

6-29-01

Ralph Hight

Chief, Engineering & Construction Division

Ralph R Hight 6-29-01

Ross Adkins

Chief, Public Affairs

Hal Capshaw

Chief, Information Management Office

Hal C Capshaw

29 June 2001

John Roselle

District Counsel

John Roselle

29 June 2001

Larry Hogue

Chief, Operations Division

Billy E. Banks

29 June 01

G. David Steele

Chief, Planning, Environmental,  
& Regulatory Division

G. David Steele

6/29/01

Charlotte Stockwell

Chief, Resource Management Office

Charlotte Stockwell

6/29/01

Richard T. Freeman

Chief, Real Estate Division

Richard Freeman

6/29/01

Rick Hedrick

Chief, Contracting Division

Rick Hedrick

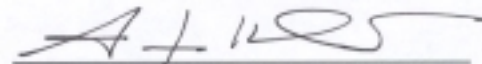
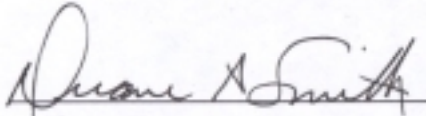
6-29-01

## PROJECT MANAGEMENT PLAN

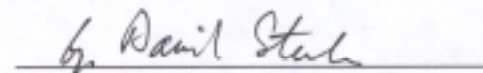
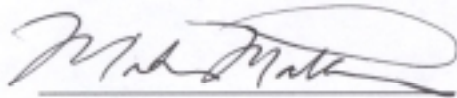
Approved by FCSA Executive Committee:

Oklahoma Water Resources Board

Corps of Engineers:



Susan Haslett  
Chief, Planning Branch



G. David Steele, P.E.  
Chief, Planning Division

## PROJECT MANAGEMENT PLAN

### TABLE OF CONTENTS

#### Page

#### SECTION 1. INTRODUCTION

1.	Study Authorization.....	1-1
2.	Prior Studies and Reports.....	1-2
3.	Study Area Description.....	1-2
4.	Study Objectives and Constraints.....	1-2
5.	Statement of Problems and Opportunities.....	1-4
6.	Existing Conditions.....	1-4
7.	Future Without-Project Conditions.....	1-7
8.	Alternatives to Consider During Feasibility.....	1-8

#### SECTION 2. RESOURCE ALLOCATION

1.	Programs and Project Management Division.....	2-1
2.	Planning, Environmental, and Regulatory Division.....	2-1
3.	Contracting Division.....	2-2
4.	Engineering and Construction Division.....	2-2
5.	Real Estate Division.....	2-3
6.	Office of Counsel.....	2-3
7.	Public Affairs Office.....	2-3
8.	Operations Division.....	2-3
9.	Southwestern Division and Headquarters.....	2-3
10.	Local Sponsor.....	2-4

#### SECTION 3. RESPONSIBILITY ASSIGNMENT MATRIX

1.	Organizational Breakdown Structure.....	3-1
----	---	-----

#### SECTION 4. SCOPE OF STUDIES

1.	Introduction.....	4-1
2.	Basic Requirements.....	4-1
3.	Plan Formulation.....	4-4
4.	Hydrology and Hydraulic Studies.....	4-5
5.	Surveys and Geotechnical Studies.....	4-6
6.	Engineering and Design Analysis, Cost Estimates, and Preliminary Drawings.....	4-7
7.	Socioeconomic Studies and Analysis.....	4-8

## PROJECT MANAGEMENT PLAN

### TABLE OF CONTENTS

#### Page

#### SECTION 4. SCOPE OF STUDIES (Continued)

8.	Financial Analysis.....	4-9
9.	Real Estate.....	4-10
10.	Environmental Studies and Environmental Impact Statement.....	4-11
11.	Public Involvement and Coordination.....	4-13
12.	Project and Study Management.....	4-14

#### SECTION 5. WORK BREAKDOWN STRUCTURE

#### SECTION 6. REFERENCES TO STATUTES, REGULATIONS, AND GUIDANCE

#### SECTION 7. QUALITY CONTROL PLAN

1.	Study Team.....	7-1
2.	Study Progress.....	7-1
3.	Technical, Legal, and Policy Review.....	7-1
4.	Coordination Documentation.....	7-3

# PROJECT MANAGEMENT PLAN

## TABLE OF CONTENTS

### Page

#### List of Tables

3-1	Organizational Breakdown Structure.....	3-1
3-2	Responsibility Assignment.....	3-2

#### List of Figures

1-1	Study Area.....	1-3
7-1	Technical Review Checklist.....	7-4
7-2	Certification of Independent Technical Review.....	7-14
7-3	Completion of Independent Technical Review.....	7-15
7-4	Certification of Legal Review.....	7-16
7-5	Southeast Oklahoma General Investigation Feasibility Study Team.....	7-17

#### Appendices

A	Feasibility Cost Estimate
B	Project Schedule



**PROJECT MANAGEMENT PLAN**  
**SOUTHEAST OKLAHOMA FEASIBILITY STUDY**

**SECTION 1. INTRODUCTION**

This Project Management Plan (PMP) was prepared in accordance with Engineering Circular (EC) 1105-2-208, dated December 1994, and Engineering Regulation (ER) 1105-2-100, dated April 2000. The PMP was developed in cooperation with the sponsor, the Oklahoma Water Resources Board (OWRB), and describes the scope, schedule, and budget for accomplishing feasibility study tasks. The purpose of the feasibility study is to identify, evaluate, and recommend an implementable solution to preserve and/or restore the riverine ecosystem of the Kiamichi River Basin between the confluence of Jackfork Creek and the Kiamichi River and the upper reaches of Hugo Lake over the 50-year period of analysis.

An important element of Project Management is the development of a Project Management Plan (PMP) of which this is the first iteration. The PMP is a working document that can be used as a guide to help facilitate the development and subsequent completion of the feasibility study. The purpose of the PMP is to ensure that both the Federal Government and the non-Federal proponent are aware of and in agreement with such items as project scope, schedule, cost and treatment of contingencies, where applicable. The study will be executed through compliance with Corps of Engineers regulations, as well as Federal, State, and local laws.

**1. STUDY AUTHORIZATION**

The Section 905(b) Water Resources Development Act of 1986 (WRDA 86) Analysis was prepared as an initial response to the Energy and Water Development Appropriations Act 2000 (Public Law 106-60). The appropriations language in the House Committee on Appropriations Report 106-253, dated July 23, 1999, reads in part:

"The Committee has provided funding for a reconnaissance study of flooding and related water resource issues in Southeast Oklahoma, Oklahoma."



## **2. PRIOR STUDIES AND REPORTS**

The following reports were reviewed as part of the reconnaissance phase:

a. Central Oklahoma Project, Feasibility Report for Water Resources Development, March 1978, Corps of Engineers. This report presented a variety of alternatives for water supply for central and southwest Oklahoma using water resources from Southeast Oklahoma.

b. Red River Basin, AR, TX, LA, and OK Interagency Comprehensive Technical Report, Volume 3, March 1989, Soil Conservation Service, Bureau of Reclamation, and Corps of Engineers. This report studied the water resource problems, needs, and opportunities within the Red River Basin.

c. Kiamichi River Basin Water Resources Development Plan, February 2000, Oklahoma Water Resources Board. This report addressed ways to facilitate development of the Kiamichi River Basin's water supplies and identified potential benefits for citizens of Oklahoma using those resources.

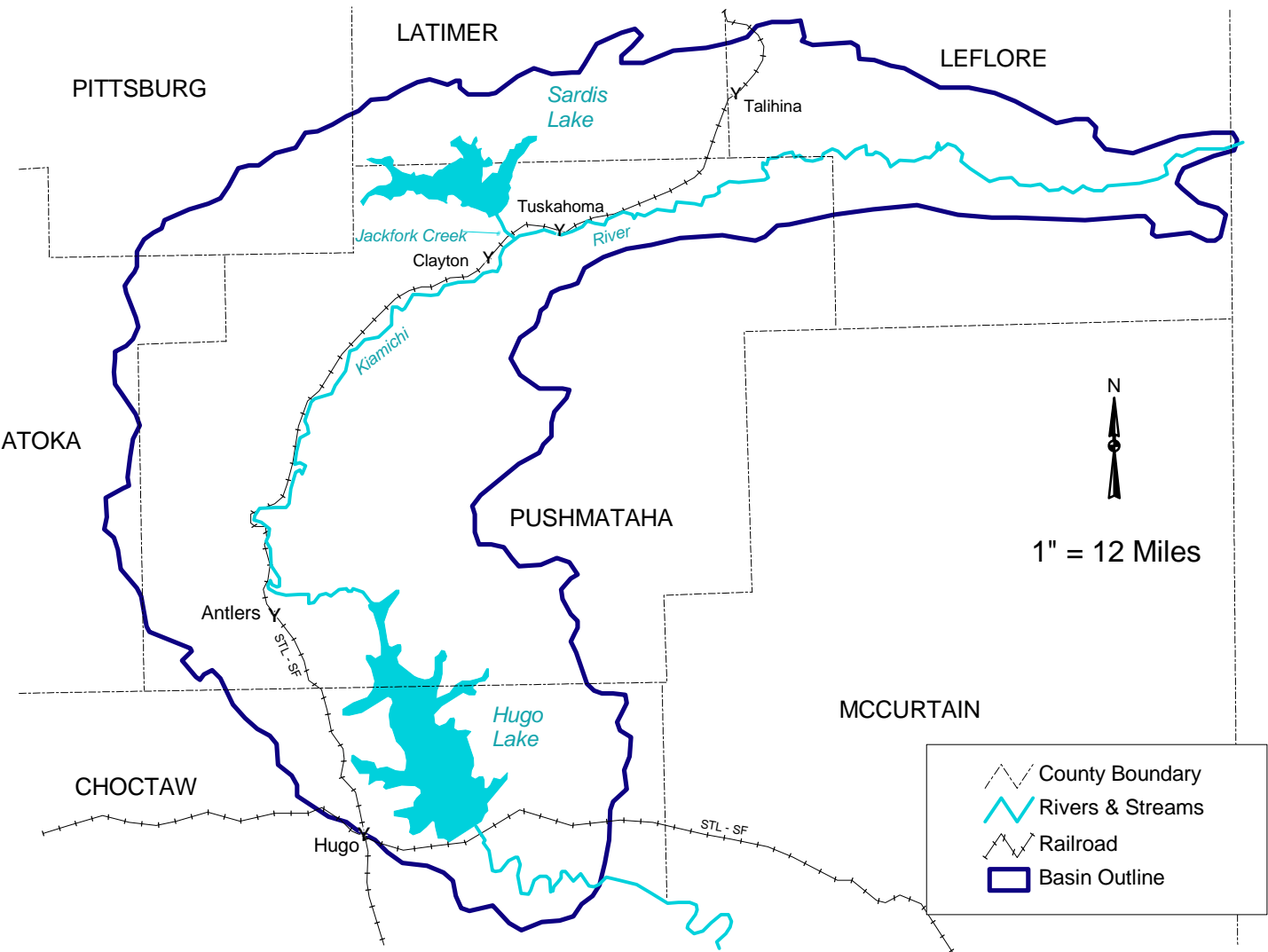
## **3. STUDY AREA DESCRIPTION**

The study area consists of 29 counties in Southeast Oklahoma, primarily focusing on the Kiamichi River Basin (see Figure 1-1). The Kiamichi River is a tributary of the Red River and flows south-southwesterly through southern Oklahoma to its confluence with the Red River near Hugo, Oklahoma. The basin contains a drainage area of 1,830 square miles. It is 130 miles long and 30 miles wide at its widest point. The Kiamichi River Basin topography is primarily composed of ancient mountains with deep, narrow valleys and swift flowing streams. Elevations range from 2,400 feet near Muse to about 440 feet in the lower reaches near Hugo Lake. Two Corps of Engineers reservoirs are located in the Kiamichi River Basin - Sardis Lake near Clayton in the upper basin and Hugo Lake near Hugo in the lower basin.

## **4. STUDY OBJECTIVES AND CONSTRAINTS**

The objective of the reconnaissance phase was to identify a Federal interest in participating with a local sponsor to:

# KIAMICHI BASIN



## VICINITY MAP

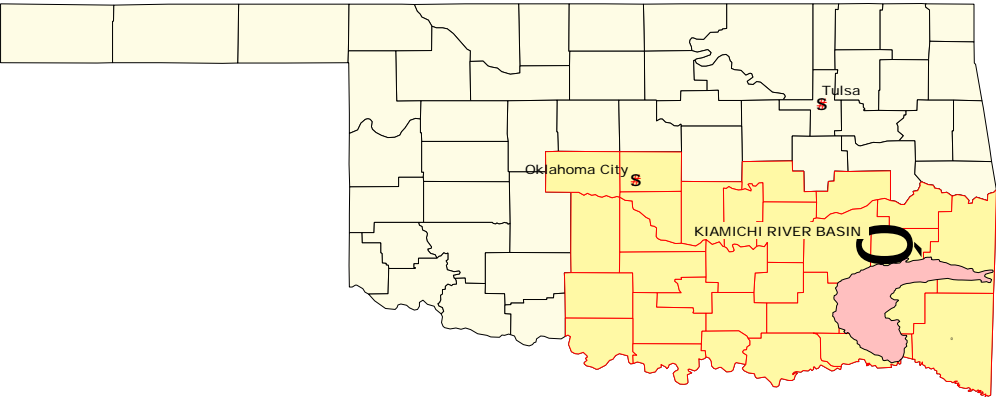


Figure 1-1

Preserve and/or restore the riverine ecosystem of the Kiamichi River Basin between the confluence of Jackfork Creek and the Kiamichi River and the upper reaches of Hugo Lake over the 50-year period of analysis.

The planning constraints identified were:

- a. Avoid negative impacts to threatened and endangered and other species in the study area,
- b. Minimize impacts to cultural resources in the study area,
- c. Minimize negative impacts to turbidity in the Kiamichi River and its tributaries,
- d. Minimize reduction of dissolved oxygen in the Kiamichi River and its tributaries,
- e. Minimize water losses due to evaporation.

## **5. STATEMENT OF PROBLEMS AND OPPORTUNITIES**

The riverine ecosystem in the Kiamichi River Basin is degrading as a result of development in the basin. Some indicator species of the diverse riverine ecosystem are already in decline. Loss of these indicator species breaks down the food chain of the ecosystem and will heavily impact the overall condition of the ecosystem throughout the Kiamichi River Basin. Flow and thermal regime conditions are key to the survival of the indicator species.

Potential opportunities identified during the reconnaissance study include:

- a. Restore riverine ecosystem in the Kiamichi River Basin,
- b. Increase habitat for aquatic species in the Kiamichi River Basin.

## **6. EXISTING CONDITIONS**

The Kiamichi River Basin is located in Choctaw and Pushmataha counties, Oklahoma, and has a drainage area of 1,830 square miles. The river originates in southeastern LeFlore County, flows west and southwest across western Pushmataha County, and then turns southeast across Choctaw County to the

Red River. The basin is 110 miles long, and the width varies from 5 to 30 miles. The northern two-thirds of the basin lie in the Ouachita Mountains physiographic province. This location represents an ecotonal region between the Prairie Parklands to the west and the Southern Floodplain Forest to the east. As such, the faunal assemblages of the Kiamichi Basin are highly diverse, with several western species at the easternmost edge of their ranges and many eastern forms near the edge of their westernmost ranges. Also, several unique or rare aquatic species are found within the basin. Representative taxa historically known to occur within the basin include 24 species of mussels, 85 species of fish, 55 species of amphibians, 158 species of reptiles, 160 species of birds, and 51 species of mammals.

Since the 1970's, many land use changes have been gradually occurring within the watershed that appear to be impacting the habitat and water quality of the Kiamichi River Basin for indigenous species. Non-point source runoff from ranching and chicken production facilities has contributed to nutrient loading in the basin. Increased sediment loading and use of selected herbicides from silviculture practices within the upper watershed may also be impacting the water quality of the river. Construction and operation of reservoirs within the basin have reduced the amount of physical habitat for some species, and operation of the reservoirs may be impacting the natural flood cycles and the thermal regime of the Kiamichi River.

Hugo Lake is located in the lower Kiamichi River Basin. This multipurpose reservoir became operational in 1974. The lake was Federally authorized and constructed, and has available storage for flood control, water supply, and water quality. Construction of the lake altered the ecosystem of the lower Kiamichi River Basin. This area provided habitat for many of the mussel species found in the Kiamichi River Basin.

Sardis Lake is located on Jackfork Creek in the lower Kiamichi River Basin. Jackfork Creek flows into the Kiamichi River northeast of Clayton. Sardis Lake was Federally authorized and constructed, and became operational in 1983. The lake only has storage for flood control and water supply. Operation of Sardis Lake may have altered stream flow on the lower Kiamichi River and also may have affected the thermal regime of the river.

Resource agencies are concerned about impacts associated with the cumulative effects due to land use changes within the basin for some aquatic species in the Kiamichi River Basin. Those species include the Blackspot Shiner, Goldstripe Darter, Crystal Darter, Peppered Shiner, Pallid Shiner, Kiamichi Shiner, Rainbow mussel, Ouachita Creekshell mussel, Scaleshell mussel, Ouachita Kidneyshell mussel, Little Spectacle Case mussel, Southern Hickorynut mussel, Butterfly mussel, Louisiana Fatmucket mussel, Monkeyface mussel, Squawfoot mussel, Three-Horned Wartyback mussel, and the Mississippi Map Turtle.

Also, populations of two Federally-listed threatened and endangered mussel species in the basin appear to be declining. The Ouachita Rock Pocketbook mussel (*Arkansia wheeleri*) is a Federally-listed endangered species found in the Kiamichi, and the Winged Maple Leaf mussel (*Quadrula fragosa*), also a Federally-listed endangered species, is believed to occur there as well. Both species depend on stream flows with good water quality for survival; however, both are rapidly declining due to impacts associated with the aforementioned land use changes.

Mussels are important indicator species in riverine ecosystems. Mussel beds and the spent shells of mussels in these beds provide habitat for benthic macroinvertebrates. Mussels also serve an important role as filter feeders. Through the feeding process, mussels provide nutrients for benthic macroinvertebrates. Mussels are dependent on appropriate substrate and flow conditions. Modified conditions could result in a loss of significant habitat and food resources for other aquatic fauna, thus disrupting the entire riverine ecosystem.

Four major tributaries of the Kiamichi River are located between the confluence of Jackfork Creek and the Highway 3 bridge southeast of Antlers. These tributaries account for approximately 30% of inflows into Lake Hugo. The tributaries are Pine Creek (John's Valley), Buck Creek, Tenmile Creek, and Cedar Creek. Each tributary provides habitat for a warm water aquatic community. The OWRB considers the Kiamichi River a source of high quality water. The water quality along this segment of the river is generally good, with primarily agricultural runoff providing nutrient load to the river.

The Kiamichi River Basin includes portions of Pittsburg, Latimer, LeFlore, Pushmataha, Atoka, and Choctaw counties in Southeast Oklahoma. However, implementation of any alternative plan could have impacts in the entire 29-county Southeast Oklahoma area. The estimated 1990 population in the basin was

about 25,600. The population of the Kiamichi River Basin resides primarily in rural areas and earns incomes well below incomes earned by populations living in other portions of the state.

Most of the aquatic habitat for restoration is in Pushmataha County. According to State estimates, the 1999 population of Pushmataha County was 11,500, slightly larger than its 1990 Census count of 10,997. The city of Antlers, the largest city in the county, has an estimated population of 2,500. The population density for the county is 3.0 persons per square kilometer. The per capita income in Pushmataha County was \$13,512 as compared to the State per capita income of \$21,694. Of the 77 counties in the state, Pushmataha ranks 76<sup>th</sup> in per capita personal income. The 1995 median household income for the State of Oklahoma was \$26,495 while the Pushmataha figure was \$18,763. An estimated 31.2% of the county population live in households with incomes below the poverty level as compared to 18.2% of the State's population. Retail trade, construction, manufacturing, and health services are the largest employing industries in the county. The average 1999 unemployment rate in Pushmataha County, 5.2%, is higher than the State of Oklahoma rate of 3.6%.

## **7. FUTURE WITHOUT-PROJECT CONDITIONS**

The existing land use changes that have occurred since the 1970's are expected to occur into the future. The existing agriculture and silviculture activities will probably continue to increase along with the resultant changes and impacts on water quality.

The existing physical loss of aquatic habitat resulting from construction of existing reservoirs will remain the same. Any physical loss of habitat, alteration of stream flows, or modifications to the thermal regime of the Kiamichi River could severely impact the habitat of the riverine ecosystem in the basin.

The State of Oklahoma projects a population of 28,900 in 2020 in the Kiamichi River Basin. The growth is linked to overall economic development in Southeast Oklahoma. Historically, this area has fewer employment and income opportunities than elsewhere in the state. Persistent unemployment and relatively low incomes should continue in the next 20 years. The resultant population growth will be below that expected in other areas of the state.

The relatively depressed economy of the Kiamichi River Basin does not offer any opportunity to divert economic resources to preservation/restoration of the watershed's riverine ecosystem. Without assistance, it is doubtful any local action will be taken.

## **8. ALTERNATIVES TO CONSIDER DURING FEASIBILITY**

The Corps is required to consider "No Action" as one of the alternatives to comply with requirements of the National Environmental Policy Act (NEPA). No Action is the condition reasonably expected to prevail over the period of analysis, given current conditions and trends, and assuming that no project would be implemented by the Federal Government to achieve the planning objectives. No Action, which is synonymous with the "Without Project Condition," forms the basis from which all other alternative plans are measured.

The Section 905(b) analysis recommended that the planning effort continue into the feasibility phase. As a part of the reconnaissance study, both structural and nonstructural measures that would provide ecosystem restoration benefits in the Kiamichi River Basin were considered. These alternatives will be studied in detail during the feasibility phase.

**a. Alternative A** provides sustained minimum flows by making releases from Sardis Lake. This alternative affects 56 river miles of the mainstem of the Kiamichi River. No tributaries are affected.

**b. Alternative B** provides more natural seasonal flows by implementing a lake level management plan at Sardis Lake. This alternative affects 56 river miles of the mainstem of the Kiamichi River. No tributaries are affected.

**c. Alternative C** increases stream temperature by modifying the intake structure at Sardis Lake. This alternative affects 56 river miles of the mainstem of the Kiamichi River. No tributaries are affected.

**d. Alternative D** provides additional flows in the lower Kiamichi River Basin by constructing a small dam on one or more of four tributaries of the Kiamichi River. This alternative affects anywhere from 26 to 118 river miles of the Kiamichi River and its tributaries, depending on the reservoir(s) chosen for construction.



**e. Alternative E** combines **Alternatives A and C**. This alternative provides minimum sustained flows on the Kiamichi River. Water temperature is increased to more closely meet the requirements of the riverine ecosystem.

**f. Alternative F** combines **Alternatives A and D**. This alternative provides minimum sustained flows by releases from Sardis and one to four additional dams on tributaries in the lower Kiamichi River Basin.

**g. Alternative G** combines **Alternatives B and C**. This alternative provides seasonal flows and increased water temperature.

## **SECTION 2. RESOURCE ALLOCATION**

The work effort for the proposed project has been developed through coordination with the resource elements involved in the project. Overall project management is provided by the Project Manager (PM) in Programs and Project Management Division. The Lead Planner in Planning, Environmental, and Regulatory Division provides study supervision and coordination. The functional managers provide technical resources for the study team and must maintain the schedule and costs of their technical resources to meet overall study objectives. The technical managers provide quality assurance of contracted products or services provided through their area of expertise, as described in their Quality Assurance Plan. The managers ensure that independent technical reviews are utilized to provide quality control of in-house products. The Quality Control Plan for this study is included as Section 7 of the Project Management Plan. The resources needed for this project are briefly described below by functional area.

### **1. PROGRAMS AND PROJECT MANAGEMENT DIVISION**

**Civil Works Branch (PP-C).** The PM resides in the Civil Works Branch and provides overall management and leadership of the project. The PM is responsible and accountable for successful completion and delivery of the project to the customer within established costs, schedules, and quality parameters. The PM assures that the customer's interests are properly represented within the U.S. Army Corps of Engineers and serves as the primary point of contact between the customer and the Corps.

### **2. PLANNING, ENVIRONMENTAL, AND REGULATORY DIVISION**

**Planning Branch (PE-P).** Planning Branch provides the Lead Planner who coordinates preparation of the technical data and provides plan formulation to identify a selected plan. Planning Branch prepares the study document, the feasibility report. The economist in Planning Branch conducts the economic analyses used to determine project benefits. The social scientist in Planning Branch assists with public involvement coordination activities.

**Environmental Analysis and Compliance Branch (PE-E).** The Environmental Analysis and Compliance Branch prepares the environmental documents needed for the selected plan. They also coordinate with the U.S. Fish and Wildlife Service (USFWS) for the Service's Coordination Act Report. In conjunction with the

Service, they develop a mitigation plan to offset the project's impact on environmental and cultural resources. The archeologist in this branch evaluates impacts to cultural/historic resources. Other technical staff in the branch determines the potential for hazardous and toxic waste materials within the study area.

**Regulatory Branch (PE-R).** As part of environmental compliance, the Regulatory Branch provides guidance in accordance with Section 404 of the Clean Water Act and Section 401 water quality certification. Depending on the project scope, the Regulatory Project Manager will issue a nationwide permit or prepare an application for an individual permit on behalf of the applicant. After the designated comment period, a Section 404 permit for the project will be issued, with permit conditions stated.

### **3. CONTRACTING DIVISION**

**Civil Contracts Branch (CT-C).** This branch administers and provides any professional services contracts that would be needed on the project.

### **4. ENGINEERING AND CONSTRUCTION DIVISION**

**Civil Design Section (EC-DC).** This section provides the design engineers that develop design features of the selected plan, prepare quantity estimates, determine necessary utility relocations, and prepare signed engineering drawings. They prepare right-of-way drawings that show the fee acquisition areas needed for the project. These drawings and other information regarding real estate requirements are provided to the Real Estate Division.

**Geotechnical Engineering and Dam Safety Section (EC-DD).** This section coordinates the detailed soil investigation and soils testing needed for design of the selected plan. The work for this study will most likely be performed by contract. This section will provide the typical section to be used by the design engineers. They will also obtain necessary field survey information to verify field conditions for preparation of detailed plans.

**Cost Engineering Section (EC-DA).** This section prepares the detailed cost estimate (M-CACES format) from the materials quantities and includes the real estate estimate to determine the project implementation cost of the selected plan.

**Hydrology and Hydraulics (H&H) Branch (EC-HA).** H&H Branch provides the hydrologic and hydraulic data needed to determine the design criteria of the selected plan. They determine the existing and modified hydrologic conditions within the study area and help identify alternative plans. They provide the data needed by the economist in Planning Branch to determine the economic benefits of the proposed plan.

## **5. REAL ESTATE DIVISION**

Real Estate Division (RE) provides an estimate of the values of the lands, easements, rights-of-way or disposal areas, and associated administrative costs required for the project. Their lands estimate is provided to Cost Engineering Branch for inclusion in the total implementation cost estimate.

## **6. OFFICE OF COUNSEL**

The Office of Counsel (OC) provides guidance as needed throughout the study. It provides review compliance with the NEPA and legal reviews of draft and final Project Cooperation Agreements prior to construction. This office also provides the preliminary legal opinion of whether a facility or utility being acquired for the project is due compensation.

## **7. PUBLIC AFFAIRS OFFICE**

The Public Affairs Office (PAO) provides assistance with the public involvement activities needed to keep the public informed of study activities.

## **8. OPERATIONS DIVISION**

Operations Division (OD) provides a review of the proposed project to determine the costs of operation and maintenance, including rehabilitation, repair, and replacement of features.

## **9. SOUTHWESTERN DIVISION (SWD) AND HEADQUARTERS (HQUSACE)**

SWD provides quality assurance and HQUSACE provides policy guidance on project specific issues. HQUSACE will prepare the Chief of Engineers report signifying approval of the report recommendation. The Assistant Secretary of the Army for Civil Works reviews the report and requests the Office of Management and Budget (OMB) to review it for compliance with the

President's program. With approval of the OMB, the report can be released to Congress for authorization and funding.

## **10. LOCAL SPONSOR**

The Oklahoma Water Resources Board is the cost-sharing partner on the project. Their study team leader will participate on the Study Management Team to keep the Executive Committee informed of the progress of study activities. As the local sponsor, the OWRB agrees to the terms of the Feasibility Cost-Sharing Agreement. They will provide in-kind services during the study and a cash contribution that is their 50% share of study funding.

### **SECTION 3. RESPONSIBILITY ASSIGNMENT MATRIX**

#### **1. ORGANIZATIONAL BREAKDOWN STRUCTURE**

The Organizational Breakdown Structure (OBS) (Table 3-1) identifies the organization(s) that has(ve) responsibility or input into completing the specific task in the scope of studies.

**Table 3-1. Organizational Breakdown Structure**

<b>Resource</b>	<b>Technical Element/Description</b>
PP-C	Programs and Project Management - Civil Works Branch
PE-P	Planning, Environmental and Regulatory (PER) Division - Planning Branch
PE-E	PER Division - Environmental Analysis and Compliance Branch
PE-R	PER Division - Regulatory Branch
PA	Public Affairs Office
EC-D	Engineering and Construction (E&C) Division - Design Branch
EC-H	E&C Division - Hydrology and Hydraulics Branch
OD	Operations Division
OC	Office of Counsel
RE	Real Estate Division

The responsibility matrix displays the organizational responsibilities for performance of the work activities identified in the scope of studies. The Responsibility Assignment Matrix for the feasibility study is shown in Table 3-2.

**Table 3-2. Responsibility Assignment**

<b>Major Activities</b>	<b>Local Sponsor</b>	<b>Programs &amp; Project Management</b>	<b>Planning</b>	<b>Engineering &amp; Construction</b>	<b>Real Estate</b>	<b>Office of Counsel</b>	<b>Southwestern Division</b>	<b>Head-quarters</b>
Project Management	X	P						
Plan Formulation	X	X	P	X				
Public Involvement	X	X	P	X	X			
Surveying/mapping				P				
Environmental			P			X		
Socioeconomic			P					
Hydrology/Hydraulics				P				
Geotechnical Data				P				
Design & Costs				P	X			
Real Estate Studies					P	X		
Prepare DPR			P	X	X			
Quality Assurance			X				P	
Policy Compliance		X	X	X	X	X	X	P
Review Support	X	X	P	X	X	X		
Note: X = Involvement								
P = Primary								



## **SECTION 4. SCOPE OF STUDIES**

### **1. INTRODUCTION**

This section of the PMP describes the main tasks to be accomplished during the feasibility study. The feasibility report will document these tasks as the planning, engineering, design, environmental, and real estate activities that form the basis for the decision to provide Federal participation in construction of the recommended plan.

The work required for this study consists of detailed technical studies, field investigations, and study management activities to identify ecosystem restoration opportunities in the Kiamichi River Basin in Southeast Oklahoma. The study results will be compiled in a feasibility report, which includes an Environmental Impact Statement, supporting technical appendices, and an engineering appendix.

The feasibility report will describe the problems identified, the plans formulated, the engineering and economic feasibility of each alternative, and the social and environmental constraints and impacts for each alternative. It will include the design, costs, benefits, and impacts of the recommended plan. The work follows the guidelines set forth in the Planning Guidance Notebook, ER 1105-2-100, dated April 22, 2000, and other published Corps of Engineers regulations and guidance.

### **2. BASIC REQUIREMENTS**

The work to be performed will be split into phases with built-in checkpoints that allow the sponsor to evaluate their willingness to continue with all aspects of the feasibility study detailed in this Scope of Study. The study will consist of five phases. The tasks for each phase of study are listed below.

#### **Phase 1 - Limited Water Availability Analysis**

- Flow Analysis
- Environmental Coordination
- Red River Compact/Water Rights Analysis
- Prepare Report

#### **Phase 2 - Detailed Water Availability Model**

- Provide Data for Water Availability Model (WAM)
- Develop WAM
- Public Involvement
- Evaluate Water Use Scenarios

Prepare Findings

### **Phase 3 - Initial Screening of Alternatives**

- Determine Ecosystem Parameters
- Plan Formulation
- Preliminary H&H (Yields)
- Preliminary Design/Cost Estimates
- Public Involvement
- Environmental Studies (Planning Aid Letter)
- Prepare Interim Report

### **Phase 4 - Mapping and Geotechnical Studies**

- Feasibility Scoping Meeting
- Obtain Rights of Entry
- Initial Cultural Resources Analysis
- Surveying & Mapping
- Geotechnical Studies
- Decision Point Meeting

### **Phase 5 - Detailed Analysis of Alternatives**

- NEPA Workshops and Public Involvement
- Detailed Plan Formulation
- Final H&H Studies
- Detailed Design/Cost Estimates
- Real Estate Studies
- Cultural Resource Surveys
- Socioeconomic Analysis
- Alternative Formulation Briefing
- Financial Capability Analysis
- Environmental Impact Statement
- Prepare Feasibility Report

Phases 1 and 2 will develop a water availability model (WAM) that will be used to determine the implementability of the ecosystem restoration alternatives formulated in Phases 3 and 5. Phase 1 provides a simple analysis of flows, identifies alternatives for modifying those flows, and evaluates potential downstream impacts due to those alternative changes in flows on the Kiamichi River below Lake Hugo and on the Mountain Fork below

Broken Bow. Phase 2 provides a detailed model, in a GIS format, of water availability in 29 counties in Southeast Oklahoma.

Phase 3 will provide plan formulation and a cursory evaluation of alternatives to meet the study objectives. That information will be used to shape future study phases and may be used to exclude some alternatives from further study. During Phase 3, basic hydrology and hydraulics analyses, engineering designs, environmental studies, and real estate studies will be developed in sufficient detail to demonstrate the usefulness of each alternative.

Phase 4 will include surveying, mapping, and geotechnical studies. The screening of alternatives provided in Phase 3 will allow for a cost savings on the mapping and geotechnical studies. A decision point meeting scheduled after completion of the geotechnical studies is also included.

Phase 5 will complete the full evaluation of each alternative required by ER 1105-2-100. Detailed plan formulation, socioeconomic analysis, H&H studies, design and cost estimates, and real estate studies will be completed in this phase. NEPA compliance, cultural resources surveys, a USFWS Coordination Act Report, and an Environmental Impact Statement will also be completed.

The completed study, Phases 1 through 5, will consist of developing alternatives to provide ecosystem restoration benefits in the Kiamichi River Basin, evaluating them to determine which plan will result in the greatest NER benefits through use of an incremental analysis, and selecting a recommended plan of action. This work will be accomplished by analyzing existing conditions; identifying optimal stream conditions in the basin; evaluating an array of alternative plans from which detailed plans to provide ecosystem restoration shall be developed; preparing construction, real estate, relocation, and maintenance and operation cost estimates; computing annual benefits; developing annual costs; evaluating the financial capability of the sponsor; assessing environmental impacts of the selected plan(s), including impacts on biological, socioeconomic, and cultural resources, recreation, and land use; determining possible mitigation measures; determining design criteria and developing design, costs, and benefits of the recommended plan; and preparing the required report to present the study's findings and recommendations.

The work to be performed for the study will involve an interdisciplinary team of engineers, biologists, economists,

archeologists, sociologists, and other experts in the fields of cost estimating, real estate, study and project management, and plan formulation. The team will include members from OWRB, the Corps, and other State and Federal agencies. The study and work effort to be accomplished is described in the following paragraphs by discipline.

### **3. PLAN FORMULATION**

The Lead Planner from the District's Planning, Environmental, and Regulatory Division will coordinate the plan formulation process, with the involvement and assistance of the coordinator from the local sponsor. Management of the plan formulation effort includes such activities as planning team meetings, upward reporting, preparing study management documents, coordinating with the local sponsor and other agencies, and integrating technical investigations. The District planner will summarize the results of the technical studies leading to plan selection in the plan formulation section of the feasibility report. The report will document the alternative formulation, evaluation, and selection process used to identify the NER plan and the tentatively selected plan.

The feasibility study follows the six-step planning process specified in the Planning Guidance Notebook, ER 1105-2-100. Generally the process is: (1) identify the problems and opportunities; (2) describe existing and future without-project conditions; (3) formulate alternative plans that address planning objectives; (4) evaluate the alternatives against specified criteria, (5) compare alternative plans, and (6) select a plan for recommendation.

Screening of the alternatives is an iterative process. A preliminary set of alternatives is identified. Conceptual design, cost estimates, and preliminary ecosystem restoration benefit analysis are determined. This information, plus information obtained from the local sponsor and the interested public, is used to screen the alternatives to a final set which is then subject to detailed evaluation. Alternatives are evaluated in a risk-based framework as specified in ER 1105-2-100. Cost Effectiveness and Incremental Cost Analyses (CE/ICA) are performed to compare the alternatives and determine the NER plan. The locally preferred plan will also be evaluated if it differs from the NER plan. Annual and periodic activities for operating and maintaining the completed project are also described in the final report. This includes the environmental mitigation sites that might be required.

#### 4. HYDROLOGY AND HYDRAULIC STUDIES

The Hydrology & Hydraulic (H&H) activities will provide dependable yields of proposed reservoirs and will evaluate the availability of water in Southeast Oklahoma for implementing any of the alternatives considered in the feasibility study.

a. A limited water availability analysis will be conducted to develop base condition flows and to evaluate four withdrawal alternatives from the Kiamichi River below Hugo Dam and from the Little River near the Horatio stream gage. Period of record flow analysis, including daily flow data for the period 1938 through 1990, and computer simulation of current project operations will be utilized to identify potential downstream impacts on flows.

b. A water availability model will be developed that encompasses the major sub-basins of the Red River below Denison Dam in Southeast Oklahoma. Historical data for the period of record, including stream flows, withdrawals, return flows, evaporation, and storage, will be incorporated in the water availability model. Output stream flows, using either a weekly or daily timestep, will be used to assess whether an alternative is implementable.

c. A hydrologic model of the Kiamichi River Basin will be developed using the Corps of Engineers computer program Watershed Modeling System (WMS), version 6.0. As base data, 7.5-minute series U.S. Geological Survey Digital Elevation Models (DEM's) will be used for determining all basin parameters, such as drainage areas, basin centroids, lengths, slopes, etc. The Kiamichi River Basin will be appropriately subdivided into smaller sub-basins to model flows into and out of the proposed reservoir sites.

d. Period of record daily and/or monthly stream flows will be determined at the four proposed dam sites and at the existing Hugo Lake. Daily and monthly inflows for Hugo Lake will be taken from available data contained in the Corps of Engineers Southwestern Division's program called "SUPER". Those flows will reflect the existence of Hugo Lake as if it had been there for the entire period of record. Stream flows for the proposed dam site locations will be derived by a drainage area ratio to the Hugo Lake dam site. Stream flow records for the gaging stations located at Big Cedar, Clayton, and Antlers will also be used in the analyses.

e. Rainfall and evaporation data to be used in the water accounting process will be developed from available NOAA precipitation stations located within and adjacent to the Kiamichi

River Basin. Rainfall and evaporation data will be put into the format needed for the Corps of Engineers' WSR0UT computer program.

f. Daily/monthly stream flow records, rainfall records, and evaporation data will be entered into the WSR0UT computer program and will be used for approximately 15 alternative scenarios. Those alternatives will investigate the proposed reservoirs at Buck Creek, John's Valley, Tenmile Creek, and Cedar Creek. The proposed reservoir sites will be evaluated separately and in combination with some or all of the other proposed sites. Each alternative will also investigate the effects of the proposed site(s) on inflows into Hugo Lake. Maximum and dependable yields for each site will be determined as part of the study process.

g. Pertinent data will be determined for each of the four proposed dam sites. That data will include dam location and height, conservation and flood control storage and pool elevations, spillway size and location, low flow outlet sizes and locations, top of dam elevations, and similar type data.

h. The H&H Branch will provide support for all GIS activities. Included will be development of a basin map with all proposed dam sites, roads, highways, railroads, rivers and streams, and other pertinent information.

i. A field reconnaissance(s) of the Kiamichi River Basin and the proposed dam sites will be conducted during the course of the study.

j. A section of the Engineering Appendix will be prepared documenting the methodology and results of the hydrologic and hydraulic analysis. The H&H Branch will provide supporting graphics, plates, tables, and figures to adequately describe the study process, methodologies, results, and conclusions.

k. An independent technical review will also be undertaken to ensure that all hydrologic and hydraulic computations, assumptions, procedures, and methodologies are reviewed by qualified personnel to ensure technical quality and accuracy.

## **5. SURVEYS AND GEOTECHNICAL STUDIES**

This task will provide essential information necessary to complete engineering analysis and design. Surveys of proposed dam sites are needed to accurately determine quantities. The geotechnical studies will be crucial to determining which alternatives chosen during plan formulation can be fully evaluated.

a. Surveys. Field surveys may consist of cross sectional surveys across the creeks and any other surveys needed to accurately locate specific topographic features or structures that could impact the study. The Study Management Team may also consider it necessary to establish first floor elevations of structures within the floodplain on a very limited basis within the reaches for which a modification is recommended.

b. Geotechnical Studies. These studies will consist of obtaining soil samples along the streams and detention sites as designated by the study team, analyzing those samples, and incorporating the laboratory tests results into a report to be included as an appendix to the feasibility report. At least three samples will be collected per site: one in each abutment, and one in the streambed.

## **6. ENGINEERING AND DESIGN ANALYSIS, COST ESTIMATES, AND PRELIMINARY DRAWINGS**

This task includes preparing conceptual and detailed designs for ecosystem restoration features. Preliminary designs will be prepared for the project alternatives using a level of detail sufficient to screen the alternatives.

a. A site plan will be developed for all necessary project features, such as detention sites, drainage structures, access roads, relocations, etc. Currently available topographic information will be utilized unless it is evident that material quantities cannot be estimated within plus or minus 20% of their probable actual values. If this occurs, additional survey information in the form of a topographic survey will be obtained, consistent with site conditions, to develop details of the structural features necessary for each alternative plan (typical sections or drainage structure profiles), so that all major costs relative to the project may be determined. The designs prepared shall be in sufficient detail to develop cost estimates that meet Corps of Engineers report standards.

b. Detailed engineering design of the NER plan will be described in a Design Appendix in the feasibility report. The detailed drawings will present a plan of the overall project; plan and profiles; and typical sections of the major structural features, along with any other pertinent details such that the engineering concepts and considerations are readily apparent.



c. Cost estimates of construction, preparation of plans and specifications and construction management shall be prepared for each of the alternative plans. Quantity estimates of materials will be prepared to allow a reasonable estimate of construction costs. Unit costs will be current average unit costs of materials. Minor features may be estimated on a lump sum basis after determining the size of the feature and comparing costs of similar features. The detailed cost estimates will be included in the Design Appendix.

d. Once the project costs have been determined, an average annual cost for each alternative will be developed using the current Federal interest rate. Interest accruing during construction will be determined and added to the project cost. The total project investment will then be amortized over a 50-year period of analysis, using the discount rate specified by the Corps of Engineers at the time of calculation. An annual cost of operation and maintenance and any major replacements will be determined and added to the amortized value.

## **7. SOCIOECONOMIC STUDIES AND ANALYSIS**

The existing social, economic, and demographic conditions for the project area are documented in the feasibility report. The with- and without-project conditions are described. The without-project condition would reflect actions that may be taken in the absence of a Federal project. Social impacts on the region, communities, and groups within the project's area of influence will be evaluated. Socioeconomic impacts considered include income distribution; employment distribution; population distribution and composition; fiscal condition of the State and local governments; quality of community life; life, health, and safety factors; displacements; long-term productivity; energy requirements; and energy conservation. Impacts to minorities and low-income groups are also evaluated and incorporated into the environmental justice analysis in the NEPA document. The social and economic impacts of the proposed modifications and mitigation measures are evaluated, and any impacts on the environment from the proposed project that can be translated to economic and social losses or gains are identified and evaluated.

The benefits of the environmental restoration features will be determined and included in the benefits analysis. Cost Effectiveness and Incremental Cost Analyses will be used to determine which alternative provides the greatest NER benefits.

A narrative report of the socioeconomic impacts and environmental restoration benefits evaluation will be prepared and included as an appendix in the report. The calculable benefits will be discussed in the report supported by descriptions of the methodology of analysis and surveys conducted, documentation of the source of material, and a display of the results of the analyses. Supporting studies will be included.

## **8. FINANCIAL ANALYSIS**

The non-Federal sponsor will provide a Statement of Financial Capability and a financing plan for supporting its share of the proposed flood protection project recommended as a result of the study. The Statement of Financial Capability will provide evidence of the sponsor's authority to utilize the identified source(s) of funds and its capability to obtain remaining funds, if any are required. This will require evidence that sufficient funds are currently available or that the sponsor has a large revenue base and a good bond rating.

The financing plan will include a current schedule of estimated Federal and non-Federal costs by fiscal year; a schedule of the sources and use of non-Federal funds during and after construction by fiscal year; and the method of finance for all non-Federal outlays, including OMRR&R associated with the project.

The financial analysis will provide data and information that demonstrates that the sponsor is credit worthy. If the sponsor is relying on non-guaranteed debt to obtain remaining funds, the analysis will include data and information to demonstrate that the projected revenues are reasonably certain and sufficient to cover the sponsor's stream of costs through time.

The District Commander will assess the non-Federal sponsor's financial capability in accordance with EC 1105-2-180, dated 29 January 1988, which provides procedures and responsibilities for financial analysis in support of construction recommendations. The assessment will demonstrate that: 1) the sponsor has adequate funds to meet its financial obligations as delineated by the project funding schedule provided by the Corps; 2) the reliability of the sources of funds has been demonstrated; 3) the sponsor has full and legal access to those funds; and 4) all parties providing funding essential to meeting the sponsor's financial obligation are legally committed to providing those funds.

## **9. REAL ESTATE**

a. Rights-of-Entry permits will be obtained from local landowners to allow Corps and OWRB employees and contractors and their equipment access to lands proposed for project use. Permits will allow study team members access to the land and will enable on-site analysis required for some of the studies including, mapping, geotechnical investigations, and cultural and environmental resource assessments.

b. In accordance with ER 405-1-12, Chapter 12, a Real Estate Supplement (RES) that outlines the minimum real estate requirement for the proposed project will be prepared as an appendix to the feasibility report. The RES will provide a description of the area; the acreage and proposed estates; a discussion of any land owned by a State, Federal, or local public entity or the sponsor; an estimate of the relocation assistance required under Public Law 91-646; the M-CACES cost estimate for real estate; a discussion of the local sponsor's ability to acquire Lands, Easements, Rights-of-Way, Relocations and Disposal area (LERRD's); a discussion of mineral activity if any; a schedule of land acquisition; a preliminary assessment of the facilities or utilities to be relocated; and any other real estate information relevant to the project. At the request of the Real Estate Division, the District legal counsel will prepare the Opinion of Compensability regarding utilities being relocated.

The Real Estate Division will prepare a gross appraisal of land requirements in accordance with the Real Estate Handbook (ER 405-1-12). The appraisal foundation will be based on the necessary estates to be acquired, i.e., fee or type of easement. Data will be collected on the local real estate market regarding recent sales and offers for sale of improved and unimproved properties comparable to the right-of-way required for alternative plans. Research will involve searching deed records and contacting local appraisers, brokers, attorneys, central appraisal districts, and others knowledgeable of the local real estate market. This market information will be the basis for the values of the various types of properties within the proposed project.

The Real Estate Division will obtain right-of-entry permits for activities that require entry onto private property. Representatives will also attend meetings with the study team or sponsor when necessary.

## **10. ENVIRONMENTAL STUDIES AND ENVIRONMENTAL IMPACT STATEMENT (EIS)**

a. Preliminary coordination of the limited water availability model analysis will be conducted with State and Federal environmental resource agencies, including but not limited to the Oklahoma Department of Wildlife Conservation, the Arkansas Fish and Game Commission, and the U.S. Fish and Wildlife Service. Coordination will include discussions of current and potentially modified flow conditions and the potential impacts on species and habitat if any changes are proposed.

b. Environmental studies will include all activities necessary to comply with the NEPA and all applicable environmental laws and regulations. The Tulsa District will produce an Environmental Impact Statement (EIS) with the assistance of contractors, as required. Given the size of the potential reservoir sites and the number of river miles potentially affected by any of the alternatives, preparation of an EIS will be necessary.

Public involvement includes interagency coordination between the Tulsa District, Federal and State natural resource agencies, environmental and community groups, and interested parties. Meetings will be held to discuss data collection needs, alternatives, and environmental concerns. Newsletters, fact sheets, and/or individually written letters will be generated to keep interested parties updated on the status of the project. Planning, Environmental, and Regulatory Division will perform all work. Public involvement activities will include public meetings/workshops and interagency meetings. Coordination with State, Federal, and local agencies will be initiated immediately and maintained throughout the NEPA process.

Environmental impacts associated with construction and operation of the project will be discussed and addressed in the EIS in accordance with 40 CFR Part 1502.2. Categories of impacts to be addressed include air quality, riparian vegetation, faunal communities, floodplains and wetlands, wild and scenic rivers, water supply, threatened and/or endangered species, soils, agriculture, cultural resources, economic impacts, and cumulative impacts.

All functional elements of the District will be involved with determining impacts. Planning, Environmental, and Regulatory Division is the lead element for this activity. Most work will be performed in-house, but some contracting may be required.

Coordination with the U.S. Fish and Wildlife Service (USFWS) and the Oklahoma Department of Wildlife Conservation (ODWC) will be accomplished in accordance with the Fish and Wildlife Coordination Act of 1958. Study funds will be made available to the USFWS in accordance with the Act for justified fish and wildlife studies. Additional coordination with the USFWS will be required for threatened and endangered species in accordance with the Endangered Species Act of 1973. (The Service does not use District funds for Threatened and Endangered Species studies or for Section 7 consultation.) Coordination with natural resource agencies will be the responsibility of Planning, Environmental, and Regulatory Division. Support from other Tulsa District functional elements will also be required.

A USFWS Coordination Act Report (CAR) will be furnished by the USFWS for inclusion in the EIS. A detailed evaluation will be conducted of possible actions that would offset unavoidable impacts associated with the project. Planning, Environmental, and Regulatory Division will be responsible for funding all USFWS activities, report review, and dissemination of information to the natural resource agencies.

Potential reservoir sites will be inventoried for cultural resources. Depending on the outcome of the survey conducted by a qualified archeologist, additional investigations may be necessary. Section 106 of the National Historic Preservation Act of 1966, as amended, requires Federal agencies or project sponsors seeking Federal funding and/or permits to conduct cultural resource surveys to locate, identify, and evaluate historic properties in advance of approving an undertaking. Cultural resource surveys and evaluations of effects of undertakings on historic properties will be performed in consultation with the State Historic Preservation Office (SHPO) and affected Native American tribes.

As part of the notification process required by 40 CFR Part 1502.19, Planning, Environmental, and Regulatory Division will prepare and publish a NOA of the Draft EIS requesting public comment on the document. The NOA will be published in the Federal Register along with the name and address of a point of contact for sending comments or obtaining a copy of the document. The public has 45 days to review and comment upon the document, although an extension of 15 days may be requested.

After completion of the Draft EIS and public review and comment period, Planning, Environmental, and Regulatory Division will respond to review comments, revise the document, and prepare a Final EIS in accordance with 40 CFR Part 1502.9.

After review and evaluation of public comments, the District may decide to conduct additional workshops or hearings on the project.

After public review of the Draft EIS and end of commenting period, the District will respond to all review comments in accordance with 40 CFR Part 1503 and Part 1502.9. The comments and District responses to the comment will be included in the Final EIS. Planning, Environmental, and Regulatory Division with the support of other technical and functional elements of the District will complete this task.

As part of the notification process required by 40 CFR Part 1502.19, Planning, Environmental, and Regulatory Division will prepare and publish a NOA of the Final EIS. The public has 30 days to comment on the document. The NOA will be published in the Federal Register along with the name and address of a point of contact for sending comments or obtaining a copy of the document. A response will be provided to all comments received.

The District will prepare a Record of Decision (ROD) in accordance with procedures found in 40 CFR Parts 1506.1, 1505.2, and 1505.3 for the signature of the final decision maker as prescribed by applicable Corps regulations. Incoming letters of comment on the final EIS will be furnished for review by the decision-maker that signs the ROD.

## **11. PUBLIC INVOLVEMENT AND COORDINATION**

A Project Involvement (PI) Team of the District Planner, Public Affairs Specialist, Social Scientist, NEPA coordinator, and the local sponsor will oversee implementation of the Public Involvement Plan. Close communication between technical staff and the PI Team will be required to ensure the release of accurate information about study activities to the local community, property owners, interest groups, local officials, and the media. These activities include preparing for and conducting public workshops and coordination meetings with other agencies and interested persons.

The PI team will develop and distribute letters, notices, news articles, or radio announcements to inform the public of meetings and workshops. The team will maintain a public involvement mailing list of interested persons, media, agencies, or groups for notification of study events. They will also maintain memoranda of the public meetings and prepare a brief summary of the comments

received during and after the workshops and how they were addressed.

The results of the public involvement activities will be documented in an appendix on coordination activities. The appendix will be part of the feasibility report.

## **12. PROJECT AND STUDY MANAGEMENT**

The feasibility study will be managed under the guidance of ER 5-1-11, Program and Project Management, and will follow the six-step planning process specified in the Planning Guidance Notebook, ER 1105-2-100. Under ER 5-1-11, the PM provides leadership to a multi-disciplined team with responsibility for assuring that the project stays focused on the customer's needs and expectations and that all work is done in accordance with a management plan and approved business processes. The Lead Planner from the District's Planning, Environmental, and Regulatory Division will lead the team in day-to-day activities and coordinate the plan formulation process and preparation of the feasibility report. Management of the plan formulation effort will include activities such as team meetings, preparation of study management documents, technical coordination with the local sponsor and other agencies, and integration of all technical investigations. The Lead Planner will summarize the results of the technical studies leading to plan selection in the feasibility report. The report will document the alternative formulation, evaluation, and selection process used to identify the tentatively selected plan.

As part of the formulation process, the study will consider technical feasibility; economic feasibility; environmental impact; real estate acquisition; and views of the USFWS, the local sponsor, and study proponents. The Lead Planner will lead the study team in screening alternatives. Based on review of existing data and limited field reconnaissance, the team will develop concept level designs and cost estimates and conduct a preliminary benefit-to-cost analysis of alternatives. This information, plus information obtained from the USFWS, will be used to screen alternatives.

This feasibility study will be managed by the Project Manager (PM), with periodic assistance and assessment from other members of the team. Day-to-day technical activities will be conducted by the study manager, Real Estate managers, and project team members to ensure tight control on time and cost of project execution. A variety of management control tools have been provided through the Project Management (PM) system and through working level relationships with members of the study team. The tools include



computer software designed for project and resource scheduling and funds control. In addition, the PM will have frequent informal contact as well as formal meetings with resource managers and project team members. The District and Division Project Review Boards (PRB) will be kept informed of the project status, and will assist the PM in setting priorities and regulating the progress of the land transfer process. In addition, the Corps of Engineers Financial Management System (CEFMS) will be used to control funds within the Tulsa District.

Study status reports will be sent on a quarterly basis to Congressional representatives and Corps higher authority, when requested.

The PM will be responsible for copies of letters exchanged with the local sponsor that affect study costs, scopes, and/or schedules; official correspondence with higher authority on similar subjects; internal memoranda that bear on significant study elements, and, in general, any other correspondence that affects significant aspects of the study.

The PM will be responsible for preparation and management of internal funds control documents for allocation and management of the study. The non-Federal Sponsor will assist in project management. The PM will monitor expenditures, prepare project management reports, report study status and issues to the District Engineer and the Executive Committee, and prepare the PMP. This includes preparation of budget documents and financial reports.

The PM will prepare written trip reports that document study area visits; meetings with the non-Federal sponsor; and other trips that affect the scope, cost, or schedule of the reevaluation.

The PM will be responsible for development and negotiation of a Project Cooperation Agreement (PCA) to document project cost sharing, OMRR&R, relative roles and responsibilities for the project, and an analysis of the local sponsor's ability to meet their responsibilities under the terms of the PCA. The Initial Draft PCA Package will accompany the feasibility report and will include: (1) the PCA, (2) Federal/Non-Federal allocation of funds table; (3) PCA deviation report, if appropriate; (4) certification of legal review; and (5) District review comments.

The Study Management Team will ensure that the study will accomplish the goals established, proceed at the anticipated rate, and that the items in the Scope of Studies are followed. The draft feasibility report will be prepared within 24 months.

a. Progress Meetings. At least once each quarter during the study period, or more often if deemed necessary by the Study Management Team, the team will hold regularly scheduled meetings or telephone conference calls to review and discuss progress, problems, or other issues. The meetings will be held in a location mutually agreed upon by the Corps of Engineers and the local sponsor. The costs to the local sponsor of attending meetings will be considered a part of project management costs and will be included in the annual and final accounting of study costs. A written Memorandum for the Record (MFR) of the team meetings or telephone conference calls will be prepared by the Study Management Team. The MFR's will be numbered sequentially and will identify persons participating, subjects discussed, and conclusions reached. A copy of these reports will be available to study team members and the Executive Committee to keep them informed of the progress of the work items underway.

b. Technical Meetings. The Study Management Team will hold periodic meetings with technical elements to review study progress; prepare budget documentation; monitor and manage funds; prepare project-related correspondence; coordinate with Federal, State, and local agencies to inform them of the alternatives identified and the progress of the study; participate in Executive Committee meetings as requested; and provide guidance and support as required to ensure responsiveness to questions and concerns from the start of the study to review and approval of the final report.

c. Monitoring of Funds. The Study Management Team will use the Corps Financial Management System (CEFMS) to monitor and manage study funds. The team will use CEFMS-generated reports to monitor the obligation and expenditures of funds, prepare funds transfer with other agencies, and track funding progress.

d. Budgeting. The general investigation study process requires preparation of quarterly and annual budget documentation and monitoring of study expenditures. Budget documentation may consist of project cost estimates, benefit estimates, study cost estimates, and related project information sheets needed to support budget requests. Budget documents shall be updated periodically during each year in support of budget reviews and to reflect changing interest rates or cost estimates.

e. Contracts. Contract negotiation and administration may require that some or all of the following items be performed for each study element by individuals other than those employed by the local sponsor or the Tulsa District, Corps of Engineers:

preparation of a scope of work and a cost estimate; selection and negotiation of a contractor; monitoring progress of the work, and reviewing interim and final products.

f. Agency Coordination. Coordination with other agencies will require on-site visits and/or correspondence with Federal, State, and local government agencies, institutions, businesses, or groups with expertise, responsibilities, or resources related to drainage, flood control, transportation, agricultural activities, environmental resources, or other areas of interest to this study. Particular attention will be directed to the agencies, special interest groups, affected cities, the U.S. Fish and Wildlife Service, and those responsible for existing physical facilities directly related to or affected by the study.

g. In-Kind Services Report. If the local sponsor provides in-kind services, they will need to provide a written statement at least quarterly of its services performed during that period to obtain credit. For contracts, the request should be supported by a copy of the contractor's billing or written report of progress. The statement of in-kind services will identify the study activity, the number of staff hours involved, and the associated costs. In-kind credit will be verified and documented by the Project Manager following consultation with functional elements within the district.

h. Feasibility Report. The feasibility report will consist of a main report, either an Environmental Impact Statement or an Environmental Assessment, whichever document is applicable to satisfy NEPA requirements, and the Engineering Appendix. The report will be a complete decision-making document, with plan formulation based on technical studies data and published reports applicable to the project study area. The main report will be written in an easy-to-understand style using graphics, illustrations, and/or photographs to summarize study findings.

(1) The length and detail of the Environmental Impact Statement, Environmental Assessment, or other applicable document will conform to the regulations contained in 40 CFR, Parts 1500-1508, "National Environmental Policy Act," dated 29 November 1978.

(2) The appendix will be technical reports written for technical reviewers. The length and detail of the appendix will be sufficient to cover the main aspects of the subject and will follow applicable regulations for each discipline. As a minimum, appendices for the following subjects will be prepared: Hydrology and Hydraulics; Economic and Social Analysis; Geology and Soils;

U.S. Fish and Wildlife Service Coordination Act Report; Design and Cost Estimates; Real Estate Plan; Pertinent Correspondence; and Financial Capability Analysis.

i. Review and Acceptance. During the feasibility study, the Government and the local sponsor will review the technical products as required. An independent, interdisciplinary peer technical review team will review the products (technical appendix). Southwestern Division (SWD) will assure quality compliance, and Headquarters (USACE) will evaluate for policy compliance. After responses are made to the review comments and the draft report has been modified accordingly, the feasibility report will be reviewed by appropriate Federal, State, and local government officials; local agencies; and interested groups and individuals. Their comments will be included in the final report.

j. Review Contingency. During the review process, the report will be submitted for Washington level review. These reviews may require that Tulsa District personnel and the local sponsor participate in preparing responses to the review comments to ensure that report approval is processed in a timely manner. The amount of work during review is determined by the number and nature of review comments and cannot be predetermined. To ensure that the local sponsor is afforded an opportunity to participate in any significant effort as a result of that review, a separate item will be included for that activity. In accordance with EC 1105-2-108, funding for this activity will be the lesser of 5% or \$50,000; the line item included in the study cost estimate will be 5% of the total study cost.

k. Issue Resolution Conferences. Two issue resolution conferences are mandatory during the feasibility phase - the Feasibility Scoping Meeting (FSM) and the Feasibility Review Conference (FRC). The FSM is called early in the study, soon after the NEPA scoping process and the preliminary plan formulation and evaluation have been accomplished. The FSM helps everyone to focus the study on key alternatives, define the depth of analysis required, and refine study constraints.

The Feasibility Review Conference (FRC) is held prior to the release of the draft Environmental Impact Statement (EIS) and draft feasibility report, unless an Alternative Formulation Briefing (AFB) was held early in the study phase. If Washington-level policy concerns are resolved by the AFB, the District would be allowed to submit the draft feasibility report concurrently for Washington level review and public release of the draft EA. This process saves the time involved in the sequential review process.

After the tentatively selected plan is identified, the AFB would be scheduled to ensure that the Corps and the local sponsor focus their resources on alternatives that are in the Federal interest.

The AFB will be attended by the District, the local sponsor, SWD, and HQUSACE and may be held as a telephone conference. The purpose of the AFB is to review study findings concerning problems and needs; evaluate the array of alternatives and determine their consistency with Federal interest; and review the preliminary analysis of the impacts of alternatives. This meeting will be a key decision point in determining whether alternatives meet Federal policies and should be recommended for project implementation. If the local sponsor has a preferred alternative that differs from the tentatively selected plan, it will be identified and reviewed at this time.

Background material in the form of pre-conference materials will be sent to SWD and HQUSACE at least 35 days prior to the conference. The design and costs presented at the AFB will be at a level of detail sufficient to screen alternatives and select the plan that will be subject to a detailed analysis. Discussion and resolution of all policy issues are documented in the AFB Policy Guidance Memorandum prepared by HQUSACE.

1. Final Report Documentation. The final feasibility report (including the final NEPA document) will incorporate the review comments from agencies, the public, SWD, and HQUSACE resulting from review of the draft document. The SWD Commander will prepare a public notice to announce endorsement of the final report. HQUSACE will prepare a written assessment of the final report to document compliance with current policy. The Chief of Engineers will prepare a brief summary of the report and send it to the Assistant Secretary of the Army for Civil Works (ASA(CW)). The Office of Management and Budget (OMB) will notify the ASA of the Administration's position on transmitting the report to Congress for authorization. If recommended by the OMB, the ASA will transmit the report with the recommendations to Congress. At that point, the feasibility phase will be complete.

## **SECTION 5. WORK BREAKDOWN STRUCTURE**

The Work Breakdown Structure (WBS) is a task-oriented hierarchy of the scope of study, and is embodied in a codified system, which organizes the study in a logical manner. The final product for this project is the completion of a Feasibility Report. As the study progresses, additional WBS information will be provided to update the PMP. The following table lists generic Work Breakdown Structure (WBS) codes for this project.

---

### WORK BREAKDOWN STRUCTURE CODES

---

WBS Code	Related Work Effort/Product
<hr/>	
<u>Project Task</u>	
FE -1	Project Management
FE- 2	Plan Formulation
FE- 3	Public Involvement
FE- 4	Survey/Mapping
FE- 5	Environmental
FE- 6	Socioeconomic
FE- 7	Hydrology/Hydraulics
FE- 8	Geotechnical Data
FE- 9	Design and Costs
FE-10	Real Estate Studies
FE-11	Prepare DPR
FE-12	Quality Assurance
FE-13	Policy Compliance
FE-14	In Progress Review (IPR)
FE-15	Draft Report
FE-16	Independent Technical Review (ITR)
FE-17	Feasibility Review Conference (FRC)
FE-18	Incorporate Comments
FE-19	Final Report
FE-20	Division Engineers Final Notice

---

## **SECTION 6. REFERENCES TO STATUTES, REGULATIONS, AND GUIDANCE**

The principal ER that guides the Corps of Engineers planning process is ER 1105-2-100, Planning Guidance Notebook, dated 22 April 2000, U.S. Army Corps of Engineers. Appendix A of ER 1105-2-100 contains references to the applicable statutes, public laws, executive orders, and engineering regulations that guide preparation of Corps feasibility studies.

Additional references that will be utilized during the completion of work tasks include the following:

EC 1105-2-208, "Preparation and Use of Project Management Plans," 23 December 1994, U.S. Army Corps of Engineers.

EC 1165-2-203, "Technical and Policy Compliance Review," Department of the Army, U.S. Army Corps of Engineers, 15 October 1996.

ER 1110-2-1150, "Engineering and Design of Civil works Projects", 31 August 1999.

ER 5-1-11, "Program and Project Management Regulation," Department of the Army, U.S. Army Corps of Engineers, 4 March 1998.

CECW-PM, Planning Guidance Letter 97-1, "WRDA 96 Implementation," 19 November 1996, U.S. Army Corps of Engineers.

CECW-PE, Planning Guidance Letter 97-10, "Shortening the Planning Process," 26 March 1997, U.S. Army Corps of Engineers.

Economic and Environmental Principles and Guidelines for Water and Related Land Resource Implementation Studies, 1983.

Economic and Environmental Consideration for Incremental Cost Analysis in Mitigation Planning, IWR Report 91-r-1, 1991.

## **SECTION 7. QUALITY CONTROL PLAN**

### **1. STUDY TEAM**

The study is assigned to and executed under the general funds and schedule management of the PM. The PM is responsible for ensuring that the products and services of the team meet the quality, expectations, and cost/schedule commitments made to the customer. In general, the study is directed by the Lead Planner and is executed by team members. The study team is a multi-disciplinary group consisting of members of the functional elements of the district and may include members from other districts or the A-E community. Team members have adequate training, technical expertise, and experience to perform the work required.

### **2. STUDY PROGRESS**

Overall progress of the study is maintained through the project schedule and budget. Study progress is also measured through coordination mechanisms, such as monthly Project Review Board meetings, study team meetings, in-progress-review meetings, and issue resolution conferences.

Review meetings and issue resolution conferences are scheduled to maintain coordination, support, and policy guidance from Division and Headquarters. A Feasibility Scoping Meeting is scheduled to follow the NEPA scoping meeting (public workshop). An Alternative Formulation Briefing is also scheduled to achieve early Headquarters acceptance of the recommendation prior to report preparation.

### **3. TECHNICAL, LEGAL, AND POLICY REVIEW**

Technical products from plan formulation, environmental, economics, engineering, cost estimating, real estate, and other disciplines essential to preparing a quality report will have an independent technical review. Reviews will be ongoing throughout the study, using a review team of engineers and scientists. The reviewers will represent the appropriate disciplines utilized in the study. Participants include but are not limited to disciplines covering Civil Engineering, Water Resources Planning, Biology, Archeology, Economics, Law, and Real Estate.

The technical review team will be composed of senior level technical staff, with oversight provided by senior technical



managers. The review team may perform individual or group reviews. They will review the decision document, technical appendix applicable to their discipline, and any A-E contractor reports that are part of the study. Participants of the review team will be provided with a Technical Review Checklist (Figure 7-1). The checklist will facilitate their review and help ensure that the decision document of the study conforms to regulations, guidance, and sound professional practice. The checklist is not intended to replace the reviewer's technical expertise or engineering judgement. Reviewer concerns or comments should be noted along with the checklist. Review team members will provide written comments to the Lead Planner. The Lead Planner will coordinate a written response through the study team members. The PM will facilitate any meetings with the review and study teams if responses to comments are deemed inadequate. Sponsor issues or concerns will also be resolved through coordination efforts of the PM. Each functional area is responsible for scheduling and coordinating additional checks and/or reviews as required by their functional area. Final responsibility for resolution of technical review issues will reside with the technical functional chief at the District. The functional chief will sign the Certification of Independent Technical Review (Figure 7-2) documenting that major concerns and issues were considered and resolved.

The review team will sign the Completion of Independent Technical Review (Figure 7-3), and District Counsel will sign the Certification of Legal Review (Figure 7-4). The project study team and the technical reviewers are listed in Figure 7-5. (The list will be updated if there are personnel changes or changes in work load.) Documentation of in-progress reviews and the final quality control review will be maintained in the project files and will be available to the PM.

A policy compliance review will be conducted in accordance with guidance provided in EC 1165-2-203, dated 15 October 1996. The policy compliance review ensures that the proposed action is consistent with the overall goals and objectives of the Civil Works program. An important milestone in policy review occurs at the Alternative Formulation Briefing. At this briefing, policy issues that have been identified will be addressed. Appendix B of EC 1165-2-203 presents a checklist of items considered during that review.

#### **4. COORDINATION DOCUMENTATION**

Project information documenting study team meetings, study status, decisions, or issue resolution is maintained in the District's project files. This includes technical review coordination and completion and the Certifications of Technical and Legal Review. Examples of other pertinent technical data or correspondence available in the project files include:

- Site maps/locations of the project area
- Real estate requirements, including right-of-entry permits, right-of-way maps, and easements
- Technical data and appendix
- Environmental Assessment, EIS, and FONSI
- Section 404 Determination and Permit
- Technical review comments
- Fact sheets
- Project related correspondence and memoranda
- Letter of support

**Figure 7-1**  
**TECHNICAL REVIEW CHECKLIST**

**1. STUDY AUTHORITY**

Does the study conform to the intent of the cited study authority?

**2. SCOPE OF INVESTIGATION**

a. Have the water resource related problems been fully and clearly evaluated?

b. Have all significant resource uses been adequately considered?

c. Have all foreseeable short- and long-term needs been adequately considered?

**3. OBJECTIVE OF INVESTIGATION**

Are planning objectives clearly stated?

**4. PLAN FORMULATION**

a. Have the assumptions and rationale for the without-project condition been explicitly stated and are they reasonable?

b. Have all reasonable alternatives, including nonstructural and no action plans, been adequately addressed?

c. Have alternatives that are not implementable by the Corps been fully considered?

d. For water supply, has a range of measures been adequately considered that can, over time, balance water demand for various purposes with water availability?

e. Has a justified plan been identified and properly evaluated?

f. Have a sufficient number of alternatives been analyzed to determine if there is a justified plan?

g. Is there sufficient rationale for any recommended departure from the NED plan?

h. Are the reasons for selection of major elements of the recommended plan sound and adequate?

i. Does the selected plan conform to existing policy? If not, have the reasons for departure been adequately documented?

j. Would staged construction be appropriate?

k. Is the selected plan consistent with applicable comprehensive plans for the area?

l. Have both beneficial and adverse effects been adequately evaluated for the selected plan and alternatives?

m. Has acquisition of necessary land for future project elements been adequately considered?

## **5. ECONOMIC ANALYSIS**

a. Has adequate consideration been given to trade-offs between economic and environmental effects?

b. Do the combined beneficial economic and environmental quality effects outweigh the combined adverse economic and environmental effects?

c. Are separable features, including mitigation measures, incrementally justified?

d. Does the report state the benefit-to-cost ratio (BCR) for the recommended plan assuming existing conditions prevail over the period of analysis?

### **1. Annual Charges**

a. Do the interest rate and the amortization period conform to present practice?

b. Has interest during construction been correctly calculated and included in the economic analysis?

## 2. Benefit Evaluation

- a. Have NED benefits been evaluated in accordance with appropriate guidelines and procedures? If not, are acceptable reasons for deviation from standard procedures furnished?
- b. Is the benefit estimate mathematically correct?
- c. Are the assumptions regarding future alternative conditions clearly stated and justified, and are these assumption reasonable?
- d. Have all known benefits been included in the benefit estimate?
- e. Are the economic projections reasonable?
- f. Have methodologies and assumptions been explained in sufficient detail?
- g. Is the information and data adequate to reasonably support the benefit estimate?
- h. Is the without-project condition reasonable and believable, and does it actually reflect how non-Federal interests will act if the resource under study is not developed?
- i. Have possibilities of windfall benefits and appropriate special cost sharing been thoroughly investigated?
- j. Are average annual benefits on the same time basis as average annual costs?
- k. Have possible negative benefits been adequately considered and evaluated?
- l. If NED employment benefits are claimed, is the area still eligible?
- m. If as a result of investigations by planning and regulatory staffs it is apparent that an activity to be conducted by a project beneficiary is not in the public interest, has (have) the projected economic benefit(s) associated with that activity been eliminated?
- n. If recreation benefits are claimed, does the report include an adequate description of competing facilities and

their existing and expected future use with and without the proposed project? Also, does the report adequately distinguish between and describe the impacts on peak versus average use in the with- and without-project conditions?

## **6. HYDROLOGY AND HYDRAULICS**

a. Does the hydrologic and hydraulic engineering analysis conform to current criteria?

b. Have water control plans been developed to the point that pertinent regulation schedules and water control diagrams have been prepared?

c. Have the regulation schedules and water control diagrams been coordinated with the local sponsor/project owner?

d. Has an interim water control plan for control of water during construction been prepared?

e. If this is the final document before plans and specifications, are all necessary engineering studies to assure that the proposed project will function as intended (including physical and mathematical models) completed or ongoing during PED?

f. Have the engineering analyses identified project impacts upstream and downstream of the project?

g. Are the residual flooding problems and other necessary project impact information adequate to form a basis for the OMR&R cost estimate and to provide a full disclosure of project performance for the local sponsor?

## **7. RISK AND UNCERTAINTY - SENSITIVITY ANALYSIS**

a. Have the plans and their effects been sufficiently examined to determine the uncertainty inherent in the data or in the assumptions of future economic, demographic, social, attitudinal, environmental, and technological trends?

b. Have the areas of sensitivity been adequately identified and proper analysis performed so that decisions can be made with knowledge of the degree of reliability of available information?

c. Does the report address the risk and uncertainty of the without-project condition assumptions, and does it test for sensitivity?

d. Have the advantages and costs of reducing risk and uncertainty been adequately considered in the planning process?

## **8. ENGINEERING**

a. Is the supporting engineering data of sufficient detail to adequately describe the proposed design?

b. Have adequate subsurface investigations been made to reasonably assure that the foundation is satisfactory?

c. Does the structural stability analysis conform to current criteria?

d. Are special design provisions required for seismic resistance?

e. Has an adequate inspection and monitoring plan been developed and a means of providing feedback to the designers been provided?

f. Is the proposed project based on sound engineering, and will the intended purpose be performed over the life of the project?

g. Is the construction schedule and period reasonable?

h. Are there any potential problems that could result from structural failure or operational procedure? If so, are measures proposed or available to minimize or eliminate the impact?

i. Are there any potential problems that could result from a catastrophic natural event? If so, are measures proposed or available to minimize or eliminate the impact?

j. Have all the necessary project features assumed in the engineering analysis, both existing or proposed (either by the Corps project or some other future effort), been identified and any necessary real estate subjugation taken to ensure project function and viability over the life of the project?

## **9. OPERATION, MAINTENANCE, AND REPLACEMENT**

a. Does the report indicate the physical criteria for satisfactory project performance that can be used as a basis for establishing sponsor's operation, maintenance, and repair and land use management responsibilities?

b. Are annual costs for operation, maintenance, and replacement reasonable?

## **10. REAL ESTATE PLAN**

a. Do the real estate interests to be acquired adequately reflect land requirements necessary for recommended project elements?

b. Are the cost estimates for land requirements reasonable (including clean-up costs that may be associated with contaminated lands)?

c. Is the acquisition schedule for land requirements reasonable?

d. Are there estimates of the number and types of ownership?

e. Is there an estimate of the acreage involved in each project purpose?

f. Does the study include the proposed estates, and are they appropriate?

g. Is there an estimate of the number of Uniform Relocation Assistance displaced persons and businesses?

h. Is there an estimate of the number and type of utility or facility relocations?

i. Does the initial Real Estate Cost Estimate include estimates for lands and damages, including lands associated with the relocation of facilities, utilities, etc.; URA relocations; and administrative costs to acquire the necessary land and contingencies?



## **11. COST ESTIMATES**

- a. Are quantity and cost estimates reasonable and in adequate detail?
- b. Are cost estimates assembled by the code of accounts in EC 1110-2-538?
- c. Are contingency allowances documented and distributed? Are they adequate to ensure high probability of achieving implementation within estimated costs?
- d. Are engineering and design and supervision and administration charges reasonable and/or in conformance with current experience?
- e. Have induced and associated costs been given proper treatment? Is this mitigation/environmental?
- f. Has the work to be performed by local interests, as required by the items of local cooperation, been properly included in the cost estimate?
- g. Have trade-offs between risk and costs been explicitly identified as areas for detailed evaluation in proper design?
- h. Does the overall project cost estimate reflect the costs associated with State and local permit actions required to implement the recommended plan?

## **12. COST ALLOCATION**

- a. Is the cost allocation in conformance with existing policies?
- b. Has the necessity for sub-allocation been adequately considered?
- c. Have all project purposes been included in the allocation?

## **13. COST APPORTIONMENT**

- a. Is the apportionment of cost to local interests in conformance with present policy and evaluation procedure?

b. Are there special circumstances associated with the project that warrant consideration of increased non-Federal cost sharing?

#### **14. COMPLIANCE WITH NATIONAL ENVIRONMENTAL POLICY ACT**

a. Have the necessary technical studies and coordination been conducted in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, and other applicable environmental laws?

b. Has mitigation of adverse effects been considered in each alternative plan and evaluated in accordance with appropriate Corps of Engineer guidelines?

c. Is the appropriate NEPA document (EA/FONSI or EIS) included in the report?

d. Has the NEPA document been developed and coordinated in accordance with ER 200-2-2?

e. Have the environmental impacts of all reasonable alternatives been properly evaluated and displayed?

f. Will the activity to be conducted require a Department of the Army permit (e.g., Section 404 or Section 10 permit), and if so, has the activity been included in the environmental documentation of the project as required by the NEPA?

g. Is the appropriate Fish and Wildlife Coordination Act document included in the report?

h. Have HTRW site assessment results been incorporated in environmental considerations?

i. Is Section 7 coordination required on endangered species?

j. Have environmental issues been adequately and thoroughly considered in plan formulation, including impacts on historic and cultural resources?

#### **15. COORDINATION**

a. Has there been adequate coordination with appropriate State, local, and Federal agencies and have their views been considered in formulating the recommended plan?

b. Has coordination conformed to law, executive orders, and agreements between agencies, and, if not, has the departure been satisfactorily explained?

c. Have the proper preservation, conservation, historical, and scientific interests been consulted, and were their views given adequate consideration during plan formulation?

## **16. PUBLIC INVOLVEMENT**

a. Was adequate public involvement conducted during the planning process to fully inform interested parties and to ascertain their views?

b. Have any international implications associated with the recommended plan been properly addressed?

## **17. LOCAL COOPERATION**

a. Are the items to be furnished by local interests those normally required under the law and by present policy, and, if not, is adequate support given for classifying the items as those to be furnished by local interests?

b. If recreation or fish and wildlife enhancement is included in multiple-purpose projects, is a letter of intent from non-Federal interests included in accordance with Public Law 89-72?

c. Have reporting officers established that local interests fully understand and are willing and capable of furnishing the local cooperation specified?

d. Has the non-Federal sponsor requested special conditions different from provisions in the model PA, and, if so, have these conditions been agreed to by HQUSACE and the ASA(CW)?

## **18. FINANCIAL ANALYSIS**

a. Does the report include a letter of intent to cost share from the non-Federal sponsor?

b. Does the non-Federal sponsor's letter of intent to cost share provide evidence of the sponsor's authority to utilize the identified source or sources of funds and provide information on

the non-Federal sponsor's capability to obtain remaining funds, if any?

c. If the sponsor is relying on third party contributions, does the letter of intent include comparable data for the third party together with evidence of its legal commitment to the sponsor?

d. If a non-Federal sponsor's financing depends on contributions of funds by a third party or parties, and the non-Federal sponsor does not have the capability to meet its financial obligations without said contribution, does the report have a separate statement of financial capability and financing plan for the contributions from the third party or parties?

## **19. POLICY ASPECTS**

a. Does the proposed project conform to policies established by law and USACE directives governing Federal participation?

b. Has the review considered current Administration policies and decisions, as well as directions, actions, and interpretations by the OMB and the ASA (CW)?

**Figure 7-2**  
**CERTIFICATION OF INDEPENDENT TECHNICAL REVIEW**

Significant concerns and the explanation of the resolution are as follows:

(Describe the major technical concerns, possible impact and resolution)

As noted above, all concerns resulting from independent technical review of the project have been considered. The report and all associated documents required by the National Environmental Policy Act have been fully reviewed.

---

Chief, Planning, Environmental  
and Regulatory Division

---

Date

---

Chief, Engineering and Construction  
Division

---

Date

---

Chief, Operations Division

---

Date

---

Chief, Real Estate Division

---

Date

**Figure 7-3**  
**COMPLETION OF INDEPENDENT TECHNICAL REVIEW**

The District has completed the feasibility study of Southeast Oklahoma. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project, as defined in the Quality Control Plan. During the independent technical review, compliance with established policy principles and procedures utilizing justified and valid assumptions was verified. This included review of assumptions, methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing Corps policy. An independent District team accomplished the independent technical review.

---

Technical Review Team Leader

---

Date

Signatures Team Members:

**Figure 7-4**  
**CERTIFICATION OF LEGAL REVIEW**

The draft report, Southeast Oklahoma Water Resources Utilization Study, including all associated documents required by the National Environmental Policy Act, has been fully reviewed by the Office of Counsel, Tulsa District and is approved as legally sufficient.

---

JOHN ROSELLE, JR.  
DISTRICT COUNSEL

\_\_\_\_\_ day of \_\_\_\_\_, 2001

**Figure 7-5**  
**SOUTHEAST OKLAHOMA**  
**GENERAL INVESTIGATION**  
**FEASIBILITY STUDY TEAM**

<u>NAME</u>	<u>SECTION</u>	<u>DISCIPLINE</u>
Phil Cline	Programs & Project Management	Project Manager
Charles Wilson	Planning, Environmental, Regulatory	Lead Planner
Jim Sullivan	Planning, Environmental, Regulatory	Economic Analysis
Ed Rossman	Planning, Environmental, Regulatory	Sociological Analysis
Jim Leach	Engineering & Construction	H&H Analysis
Stan Rohr	Engineering & Construction	Civil Design
Consultant	Engineering & Construction	Geotechnical
Jim Randolph	Planning, Environmental, Regulatory	Environmental
Louis Vogele	Planning, Environmental, Regulatory	Cultural Resources
Steve Nolen	Planning, Environmental, Regulatory	HTRW Assessment
Ted McCleary	Engineering & Construction	Cost Estimating
Rick Gardner	Real Estate	Real Estate
Andrew Commer	Planning, Environmental, Regulatory	Section 404 Permit
Carolyn Schultz	Planning, Environmental, Regulatory	Flood Plain Management
Kay Hoover	Counsel	PCA legal coordination
Member	USFWL	Coordination Act Report
Paula Willits	Planning, Environmental, Regulatory	Technical Writer
Marc Masnor	Planning, Environmental, Regulatory	Formulation

**STUDY REVIEWERS**

Randy Mead	Engineering & Construction	Geotechnical
Larry Dearing	Engineering & Construction	Civil Design
David Combs	Planning, Environmental, Regulatory	Environmental
Richard Green	Engineering & Construction	Cost Estimating
Angela McPhee	Real Estate	Real Estate
David Manning	Planning, Environmental, Regulatory	Section 404 Permit
Joe Remondini	Planning, Environmental, Regulatory	Flood Plain Management
John Roselle	Counsel	Legal Issues
Craig Wells	Planning, Environmental, Regulatory	Economic Analysis
Member	USFWL	Coordination Act Report
Member	Other Corps District	Hydrology



**APPENDIX A**

**FEASIBILITY COST ESTIMATE**

Southeast Oklahoma Feasibility Study						
Task	Duration (months)	Cost (\$)	Federal (\$)	Non-Federal (\$)	In-Kind (\$)	
<b>Phase 1 – Limited Water Availability Analysis</b>						
Flow Analysis	2	25,000	12,500	12,500	0	
Environmental Coordination	2	15,000	7,500	7,500	0	
Red River Compact/Water Rights Analysis	2	20,000	0	0	20,000	
Independent Technical Review	--	5,000	5,000	0	0	
Prepare Draft Report	1	5,000	5,000	0	0	
Present Findings	--	3,000	3,000	0	0	
Prepare Final Report	1	2,500	2,500	0	0	
Project Management	--	32,000	17,000	0	15,000	
Study Management	--	54,000	27,000	0	27,000	
Contingency	--	7,550	5,025	2,525	0	
<b>Total Phase 1</b>	<b>6</b>	<b>169,050</b>	<b>84,525</b>	<b>22,525</b>	<b>62,000</b>	
<b>Phase 2 – Detailed Water Availability Model (WAM)</b>						
Sponsor Meeting	1	10,000	5,000	0	5,000	
Develop WAM	12	590,000	295,000	147,500	147,500	
Provide Data	--	10,000	5,000	0	5,000	
Contract Admin/QC	--	50,000	25,000	12,500	12,500	
Developmental Meetings (3)	--	8,000	4,000	0	4,000	
Evaluate Water Use Scenarios (10)	3	38,000	19,000	9,500	9,500	
Independent Technical Review	--	5,000	2,500	2,500	0	
Prepare Draft Report	2	5,000	2,500	2,500	0	
Present Findings	--	3,000	1,500	0	1,500	
Prepare Final Findings	1	2,500	1,250	1,250	0	
Project Management	--	85,000	42,500	21,250	21,250	
Study Management	--	132,000	66,000	33,000	33,000	
Contingency	--	72,000	36,000	36,000	0	
<b>Total Phase 2</b>	<b>19</b>	<b>1,010,500</b>	<b>505,250</b>	<b>266,000</b>	<b>239,250</b>	

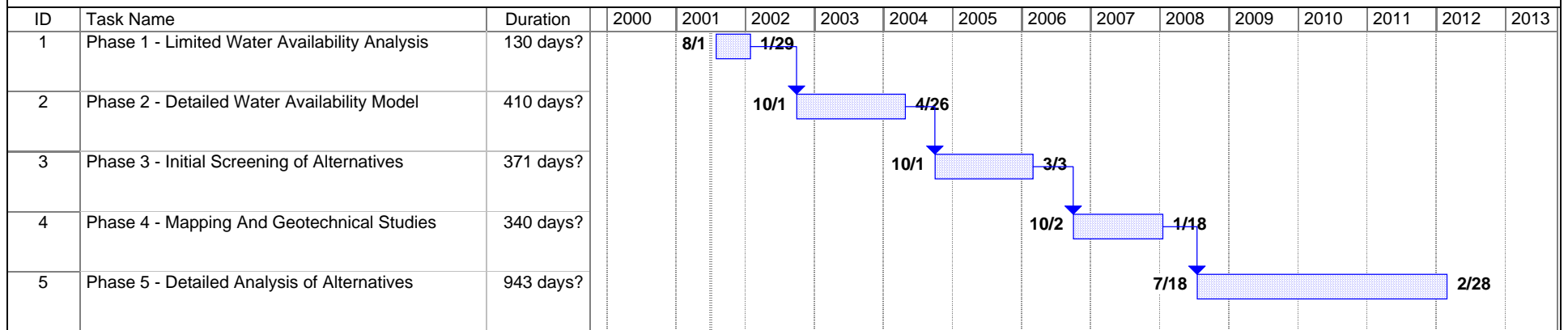
Southeast Oklahoma Feasibility Study						
Task	Duration (months)	Cost (\$)	Federal (\$)	Non-Federal (\$)	In-Kind (\$)	
<b>Phase 3 – Initial Screening of Alternatives</b>						
Sponsor Meeting	1	10,000	5,000	0	5,000	
Determine Ecosystem Parameters	2	10,000	5,000	5,000	0	
Plan Formulation	2	20,000	10,000	7,500	2,500	
Public Meeting	1	10,000	5,000	0	5,000	
Preliminary H&H (Yields)	4	32,000	16,000	8,000	8,000	
Preliminary Design/Cost Estimates	5	63,000	31,500	31,500	0	
Planning Aid Letter	9	50,000	25,000	25,000	0	
Independent Technical Review	--	10,000	5,000	5,000	0	
Prepare Draft Report	3	7,500	3,750	3,750	0	
Present Findings	--	3,000	1,500	0	1,500	
Prepare Final Report	1	2,500	1,250	1,250	0	
Project Management	--	83,000	41,500	20,750	20,750	
Study Management	--	125,000	62,500	31,250	31,250	
Contingency	--	21,800	10,900	10,900	0	
<b>Total Phase 3</b>	<b>18</b>	<b>447,800</b>	<b>223,900</b>	<b>149,900</b>	<b>74,000</b>	
<b>Phase 4 – Mapping and Geotechnical Studies</b>						
Feasibility Scoping Meeting	2	20,000	10,000	0	10,000	
Obtain Rights of Entry	9	90,000	45,000	45,000	0	
Initial Cultural Resources Analysis	2	10,000	5,000	5,000	0	
Surveying & Mapping	9	525,000	262,500	131,250	131,250	
Geotechnical Studies	12	580,000	290,000	290,000	0	
Decision Point Meeting	1	10,000	5,000	0	5,000	
Independent Technical Review	--	5,000	2,500	2,500	0	
Project Management	--	73,000	36,500	18,250	18,250	
Study Management	--	111,000	55,500	27,750	27,750	
Contingency	--	124,000	62,000	62,000	0	
<b>Total Phase 4</b>	<b>16</b>	<b>1,548,000</b>	<b>774,000</b>	<b>581,750</b>	<b>192,250</b>	

Southeast Oklahoma Feasibility Study						
Task	Duration (months)	Cost (\$)	Federal (\$)	Non-Federal (\$)	In-Kind (\$)	
<b>Phase 5 – Detailed Analysis of Alternatives</b>						
First NEPA Workshop	2	20,000	10,000	5,000	5,000	
Detailed Plan Formulation	6	40,000	20,000	0	20,000	
Final H&H Studies	3	28,000	14,000	11,900	2,100	
Detailed Design/Cost Estimates	20	550,000	275,000	275,000	0	
Real Estate Studies	9	150,000	75,000	75,000	0	
Cultural Resource Surveys	24	1,655,000	827,500	827,500	0	
Socioeconomic Analysis	6	45,000	22,500	22,500	0	
Alternative Formulation Briefing	3	25,000	12,500	0	12,500	
Financial Capability Analysis	1	10,000	5,000	0	5,000	
Environmental Impact Statement	38	315,000	157,500	157,500	0	
Second NEPA Public Workshop	2	20,000	10,000	5,000	5,000	
Independent Technical Review	--	15,000	7,500	7,500	0	
Prepare Draft Feasibility Report	4	40,000	20,000	20,000	0	
Prepare Final Feasibility Report	3	10,000	5,000	5,000	0	
Washington Level Review	--	50,000	25,000	25,000	0	
Project Management	--	200,000	100,000	50,000	50,000	
Study Management	--	307,000	153,500	76,750	76,750	
Contingency	--	297,300	148,650	148,650	0	
<b>Total Phase 5</b>	<b>44</b>	<b>3,777,300</b>	<b>1,888,650</b>	<b>1,712,300</b>	<b>176,350</b>	
<b>Total SE OK Feasibility Study</b>	<b>103</b>	<b>6,952,650</b>	<b>3,476,325</b>	<b>2,732,475</b>	<b>743,850</b>	

**APPENDIX B**

**PROJECT SCHEDULE**

**Southeast Oklahoma Feasibility Study  
Overview Schedule**



Project: SE OK Overview Schedule  
Date: Thu 6/28/01

Task

Progress

Milestone

Summary

Rolled Up Task

Rolled Up Milestone

Rolled Up Progress

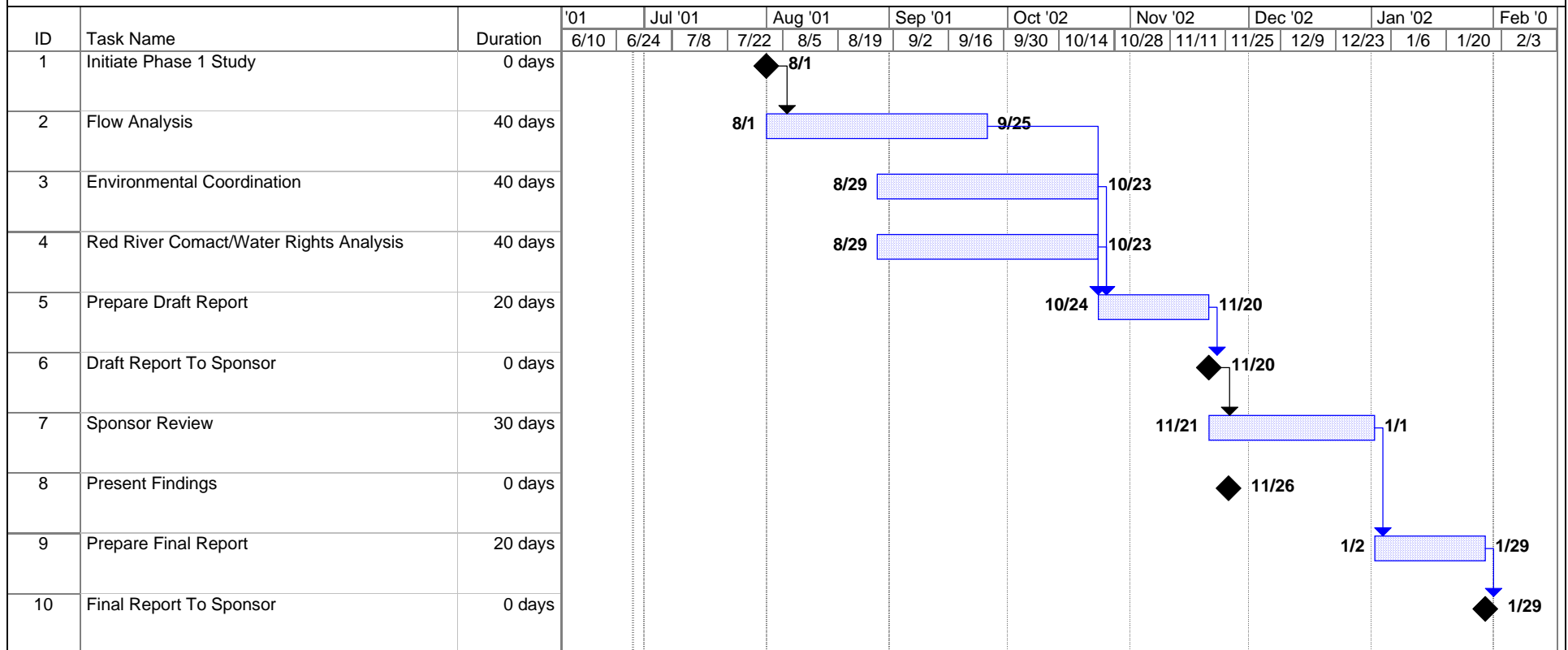
Split

External Tasks

Project Summary

Group By Summary

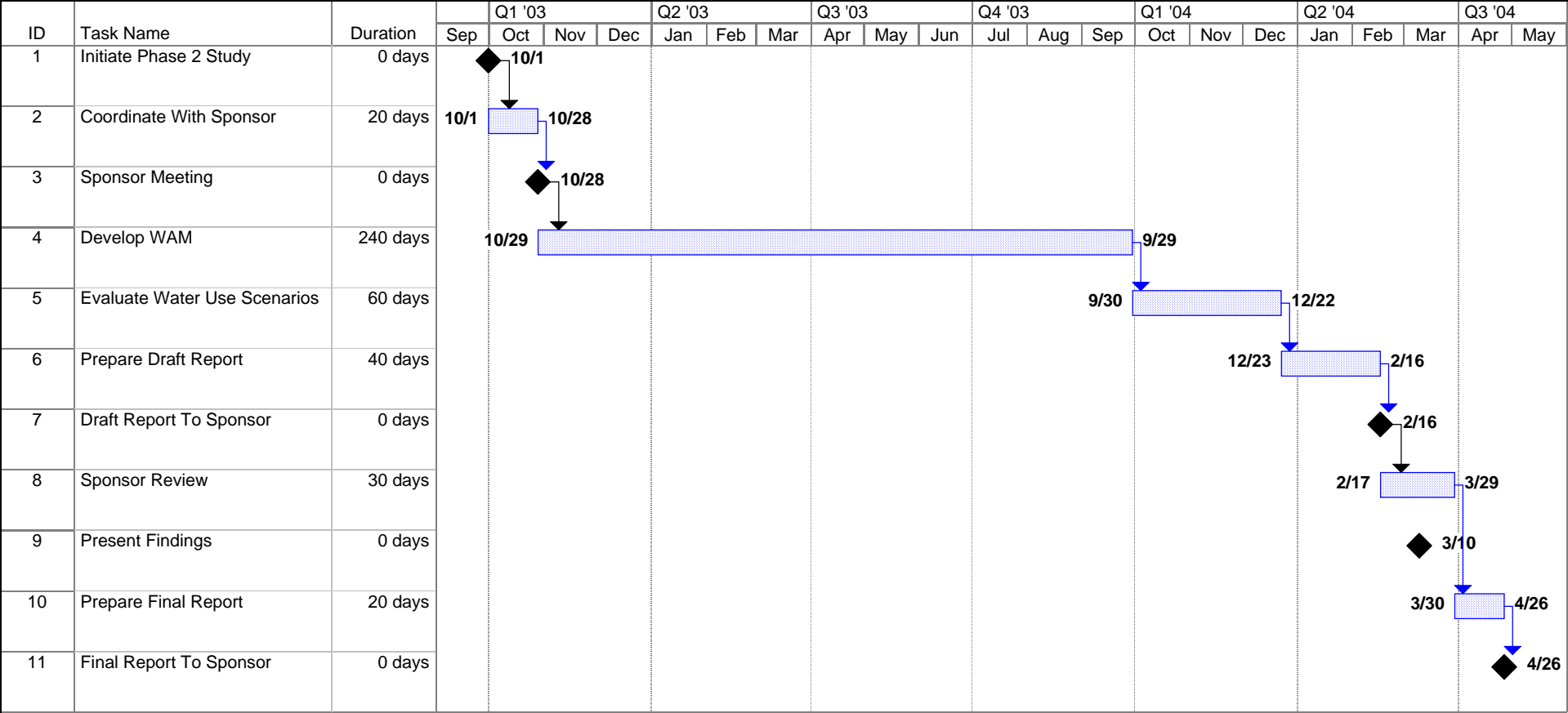
Southeast Oklahoma Feasibility Study  
Phase 1  
Limited Water Availability Analysis



Project: SEOK Phase1  
Date: Thu 6/28/01

Task		Rolled Up Task		External Tasks	
Progress		Rolled Up Milestone	◆	Project Summary	
Milestone	◆	Rolled Up Progress		Group By Summary	
Summary		Split			

Southeast Oklahoma Feasibility Study  
Phase 2  
Detailed Water Availability Model



Project: SEOK Phase 2  
Date: Thu 6/28/01

Task

Progress

Milestone

Summary

■

■

◆

■

Rolled Up Task

Rolled Up Milestone

Rolled Up Progress

Split

■

◇

■

.....

External Tasks

Project Summary

Group By Summary

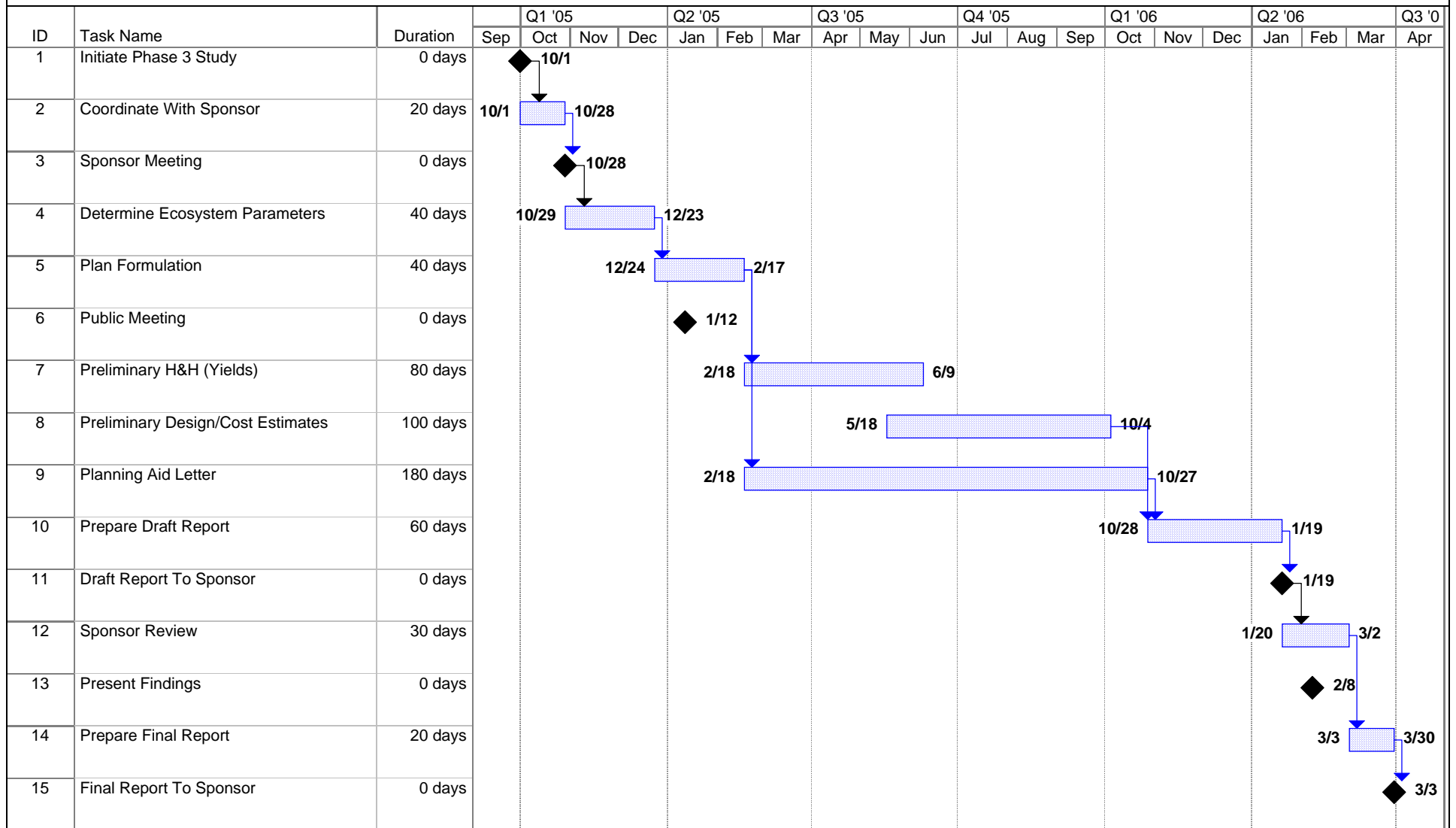
■

■

■



Southeast Oklahoma Feasibility Study  
Phase 3  
Initial Screening of Alternatives



Project: SE OK Phase 3  
Date: Thu 6/28/01

Task

Progress

Milestone

Summary

Rolled Up Task

Rolled Up Milestone

Rolled Up Progress

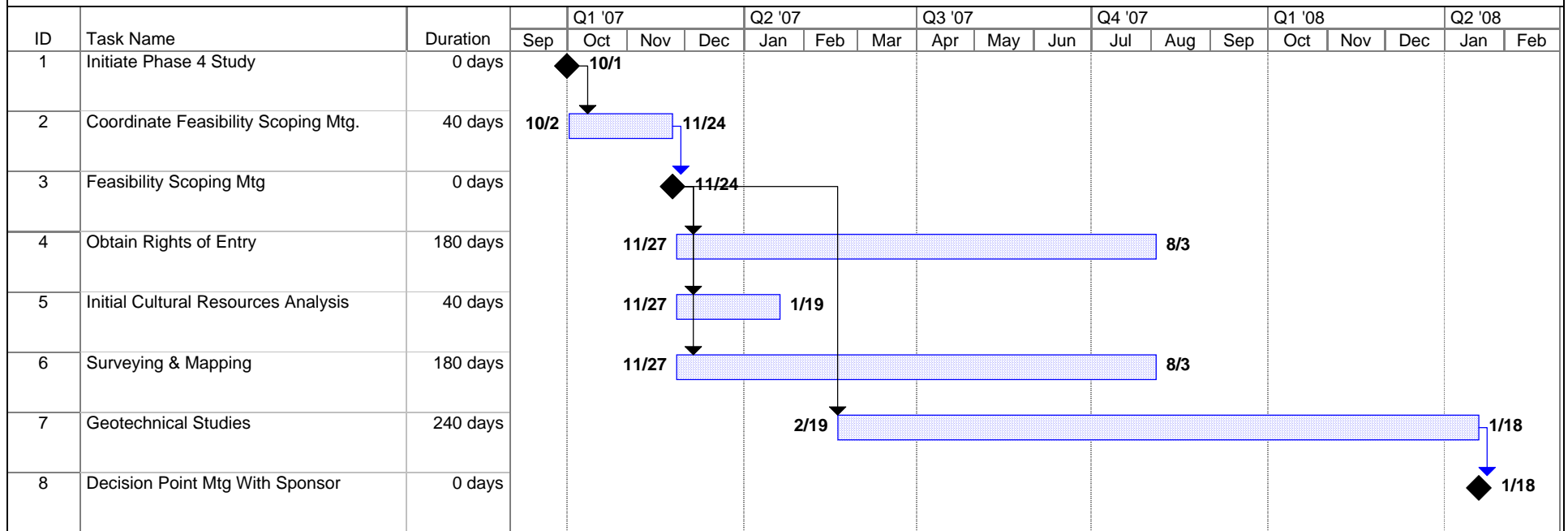
Split












External Tasks

Project Summary

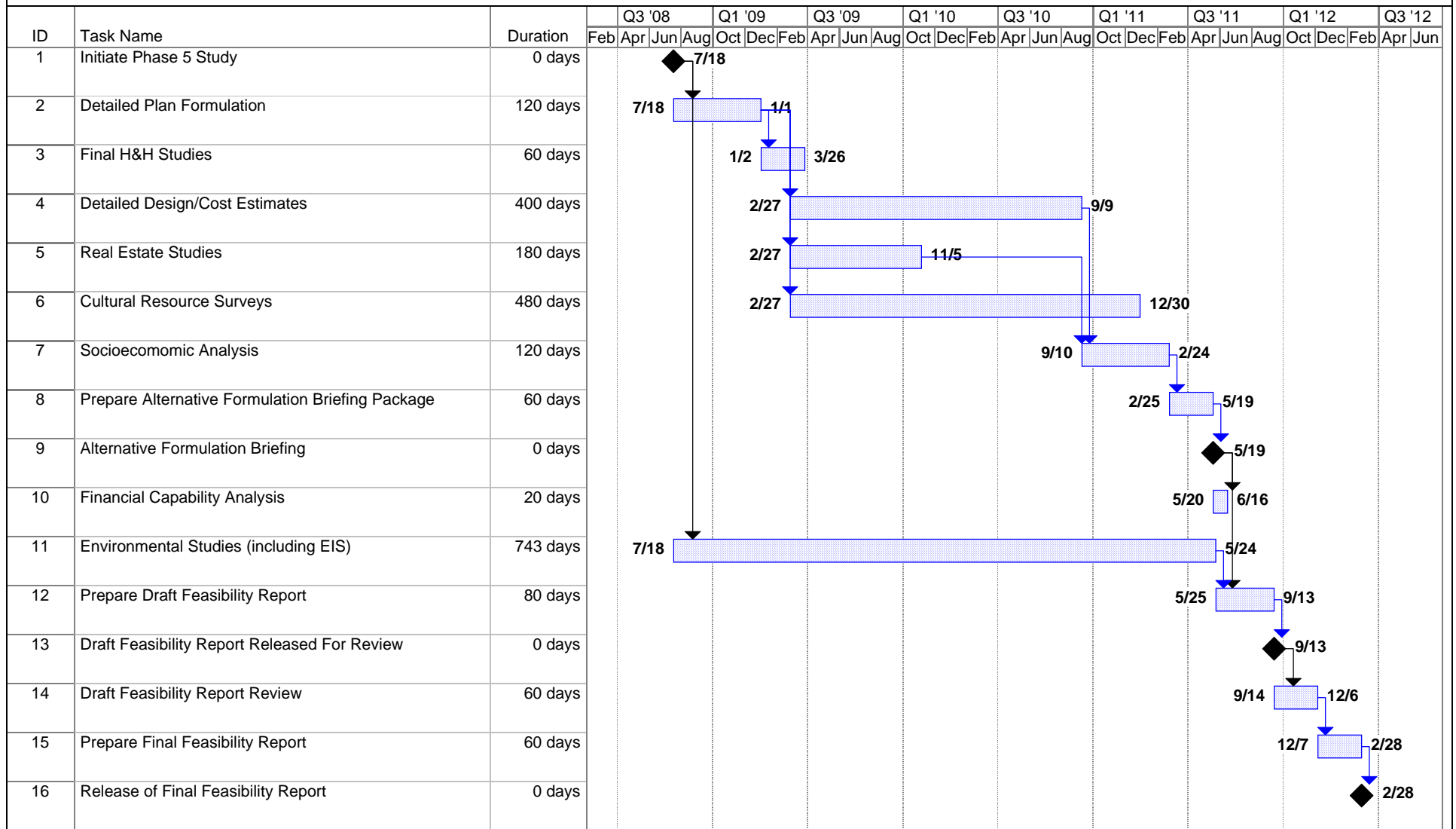
Group By Summary

Southeast Oklahoma Feasibility Study  
Phase 4  
Mapping And Geotechnical Studies



Project: SE OK Phase 4 Date: Thu 6/28/01	Task		Rolled Up Task		External Tasks	
	Progress		Rolled Up Milestone		Project Summary	
	Milestone		Rolled Up Progress		Group By Summary	
	Summary		Split			

Southeast Oklahoma Feasibility Study  
Phase 5  
Detailed Analysis of Alternatives



Project: SE OK Phase 5 Date: Thu 6/28/01	Task		Rolled Up Task		External Tasks	
	Progress		Rolled Up Milestone		Project Summary	
	Milestone		Rolled Up Progress		Group By Summary	
	Summary		Split			